Vol. 1067 Number 3

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

June 17, 1986

U.S.
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

June 17, 1986 Volume 1067 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Mar. 31, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 14, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,387,471 through 4,388,732
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 30, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,321,708	06/221,035	3/30,82
4,321,709	06/224,837	3/30/82
4,321,766	06/227,399	3/30/82
4,321,807	06/239,132	3/30/82
4,321,811	06/231,748	3/30/82
4,321,830	06/216,566	3/30/82
4,321,844	06/274,308	3/30/82
4,321,885	06/256,720	3/30/82
4,322,054	06/220,464	3/30/82
4,322,055	06/230,343	3/30/82
4,322,056	06/236,206	3/30/82
4,322,153	06/231,146	3/30/82
4,322,213	06/264,719	3/30/82
4,322,234	06/242,035	3/30/82
4,322,281	06/226,979	3/30/82
4,322,292	06/222,274	3/30/82
4,322,298	06/269,379	3/30/82
4,322,344	06/240,378	3/30/82
4,322,360	06/246,839	3/30/82
4,322,397	06/244,332	3/30/82
4,322,401	06/218,010	3/30/82
4,322,404	06/271,106	3/30/82
4,322,418	06/250,667	3/30/82
4,322,441	06/259,702	3/30/82
4,322,562	06/218,321	3/30/82
4,322,608	06/215,671	3/30/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,278,405, Re. S.N. 850,168, Filed Apr. 10, 1986, Cl. 417/150, ENERGY AMPLIFIER APPARATUS, Lonnie L. Angle, Owner of Record: *5% to each assignee Edward Barnes and Gerald G. Hawley, San Simon, Ariz.,* Attorney or Agent: C. Robert Von Hellens, et al., Ex. Gp.: 343

4,423,173, Re. S.N. 802,225, Filed Nov. 26, 1985, Cl. 524/14, LIGNOSULFONATE-PHENOL-FORMALDEHYDE RESIN BINDER, Eugene K. Janiga, Owner of Record: *Masonite Corp., Chicago, Ill.,* Attorney or Agent: Walther E. Wyss, et al., Ex. Gp.: 153

4,434,118, Re. S.N. 832,283, Filed Feb. 20, 1986, Cl. 264/109, COMPACTING POLYCARBONATE AND COPOLY (CARBONATE/PHOSPHONATE) PARTICLES, Ruey Y. Lin, Owner of Record: *Stauffer Chemical Co., Westport, Conn.,* Attorney or Agent: Roger S. Benjamin, et al., Ex. Gp.: 137

4,435,001, Re. S.N. 836,006, Filed Mar. 4, 1986, Cl. 282/11.5A, ENVELOPE ASSEMBLY, Larry E. Mills, et al., Owner of Record: *Bedinghaus Business Forms, Inc., Cincinnati, Ohio,* Attorney or Agent: Herbert C. Brinkman, et al., Ex. Gp.: 327

4,441,442, Re. S.N. 849,526, Filed Apr. 8, 1986, Cl. 112/256, SELF-OILING PORTABLE BAG-CLOSING SEWING MACHINE WITH PUMP, Robert J. Robinson, et al., Owner of Record: *Axia, Inc., Oak Brook, Ill.,* Attorney or Agent: Daniel W. Vittum, et al., Ex. Gp.: 247

4,442,333 Re. S.N. 851,792, Filed Apr. 10, 1986, Cl. 219/69W, CAPACITOR-TYPE PULSE GENERATOR FOR ELECTRICAL DISCHARGE MACHINING, ESPECIALLY FOR WIRE-CUTTING EDM, Kiyoshi Inoue, Owner of Record: *Inoue-Japax Research, Inc., Kanagawaken, Japan,* Attorney or Agent: Herbert Dubno, Ex. Gp.: 214,

4,489,044, Re. S.N. 855,284, Filed Apr. 24, 1986, Cl. 423/53, FORMATION OF TUNGSTEN MONOCARBIDE FROM A MOLTEN TUNGSTATE-HALIDE PHASE BY GAS SPARGING, John M. Gomes, et al., Owner of Record: *United States of America as represented by the Secretary of the Interior,* Attorney or Agent: E. Philip Koltos, et al., Ex. Gp.: 113

4,538,724, Re. S.N. 846,734, Filed Apr. 1, 1986, Cl. 206/003, SPIRAL BAND LOCKING MECHANISM, Bruce S. Johnson, Owner of Record: *Harsco Corp., York, Pa.,* Attorney or Agent: Harold L. Stowell, et al., Ex. Gp.: 241

4,542,356, Re. S.N. 849,527, Filed Apr. 8, 1986, Cl. 333/195, HIGH FREQUENCY NARROW-BAND MULTI-MODE FILTER, Yuzo Nakazawa., et al., Owner of Record: *Toyo Communication Equipment Co., Ltd., Kanagawa-Ken, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 252

4,554,929, Re. S.N. 847,297, Filed Mar. 27, 1986, Cl. 127/772, CATHETER GUIDE WIRE WITH SHORT SPRING TIP AND METHOD OF USING THE SAME, Wilfred J. Samson, et al., Owner of Record: *Advanced Cardiovascular Systems, Inc., Mountain View, Calif.,* Attorney or Agent: Paul D. Flehr, et al., Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Removal from Register

Pursuant to the provisions of 37 CFR §10.11(b), a letter was directed on Nov. 18, 1985, to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Patent Agents.

CAMERON WEIFFENBACH,
May 21, 1986. *Director, Office of Enrollment & Discipline.*

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Change of Correspondence Address in Trademark Applications

Applicants are reminded that when an application is filed and a correspondence address is entered in the Official record, correspondence will continue to be sent to such address until the applicant or party, or the attorney-at-law or other authorized representative of the applicant or party, indicates *in writing* that correspondence is to be sent to another address. 37 CFR Section 2.18. The filing of a response to an Office action on letterhead stationery that indicates a different address from the correspondence address of record is insufficient notice that correspondence is to be sent to another address. Specific language is needed which can reasonably be interpreted to be a request to change the address. See TMEP Section 603.

If a power of attorney has been filed in an application, a subsequently filed power of attorney will be regarded as a written request to change the correspondence address, even if there is no specific language changing

the address or revoking the prior power of attorney. See TMEP Section 603.

May 15, 1986.

MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,012,449, Yoshihisa Shikakura, Fumio Sakai and Hitoshi Shimizu, PRODUCTION OF METHACROLEIN AND OXIDATION CATALYST USED THEREFOR, Interference No. 101,491, decided Apr. 28, 1986, claims 1 & 2.

Patent No. 4,139,636, Wilhelm Sirrenberg, Erich Klauke, Ingeborg Hammann and Wilhelm Stendel, N-PHENYL-N-BENZOYL UREAS AND PESTICIDAL COMPOSITIONS AND USES THEREFOR, Interference No. 101,371, decided Feb. 7, 1986, claims 1–10.

Patent No. 4,272,514, Wayman R. Spence, HIGH ABSORPTION BODY POWDER, Interference No. 101,494, decided Apr. 28, 1986, claims 1–3.

Patent No. 4,315,685, Tsuneki Inuzuka, Koichi Murahami, Kenji Kurita and Hisashi Sakamaki, IMAGE FORMING APPARATUS, Interference No. 101,454, decided Mar. 21, 1986, claims 15 & 16.

Patent No. 4,417,050, Richard E. Cherpeck, FUNGICIDAL, HERBICIDAL AND PLANT GROWTH-REGULATING PYRIMIDYL-CONTAINING ETHERS, Interference No. 101,450, decided Mar. 25, 1986, claims 1–8.

Patent No. 4,442,089, Zola P. Horovitz, METHOD FOR TREATING GLAUCOMA WITH TOPICAL OR SYSTEMIC ACE INHIBITOR COMPOSITIONS, Interference No. 101,422, decided Mar. 12, 1986, claims 1–14.

Patent No. 4,462,502, Werner R. Luenser and Efrem M. Ostrowsky, THREADED CLOSURE WITH LINER, Interference No. 101,442, decided Feb. 26, 1986, claims 16, 17, 21–23, 26–28, 32–34 and 37.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals
and Interferences.

Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated May 20, 1986.

Copies of the Trademark Official Gazette dated May 20, 1986 were not mailed until May 28, 1986. Therefore, for marks published in the Trademark Official Gazette dated May 20, 1986, Notices of Opposition filed by June 27, 1986 will be considered timely.

May 30, 1986.

MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of June 17, 1986

D. 282,829	4,530,355	4,558,614	4,571,909
4,065,500	4,531,996	4,558,700	4,572,075
4,208,421	4,532,991	4,558,840	4,572,230
4,238,024	4,533,508	4,559,071	4,572,503
4,360,927	4,536,278	4,559,619	4,572,680
4,427,269	4,536,368	4,559,994	4,572,783
4,437,066	4,536,505	4,560,723	4,573,153
4,439,121	4,538,705	4,560,882	4,573,324
4,444,473	4,540,268	4,561,402	4,573,512
4,447,805	4,540,643	4,561,892	4,573,536
4,455,496	4,541,564	4,562,061	4,574,000
4,458,104	4,541,620	4,563,459	4,574,231
4,469,417	4,542,814	4,563,843	4,574,458
4,469,649	4,544,101	4,564,360	4,574,808
4,481,018	4,546,040	4,564,761	4,575,014
4,481,075	4,546,459	4,565,497	4,575,201
4,481,821	4,546,950	4,566,604	4,575,379
4,490,495	4,547,608	4,566,648	4,575,527
4,496,040	4,547,762	4,566,686	4,575,570
4,500,118	4,549,185	4,566,823	4,575,726
4,501,695	4,551,457	4,566,874	4,575,787
4,505,512	4,553,997	4,567,196	4,576,137
4,510,051	4,555,257	4,567,342	4,576,266
4,514,597	4,555,979	4,567,380	4,576,465
4,517,099	4,557,028	4,567,793	4,576,814
4,520,014	4,557,174	4,567,847	4,576,883
4,522,485	4,557,417	4,567,962	4,577,162
4,524,485	4,557,426	4,568,361	4,578,045
4,528,131	4,557,440	4,570,641	4,578,426
4,528,891	4,558,137	4,570,727	4,580,328

Disclaimers

3,777,778.—*George J. Janu,* Milwaukee, Wis. TWO-POSITION LIQUID LEVEL CONTROLLER. Patent dated Dec. 11, 1973. Disclaimer filed Mar. 20, 1986, by the assignee, *Johnson Service Co.*

Hereby enters this disclaimer to the remaining term of said patent.

4,142,421.—*W. Gene Stevens,* Dunlap; and *Raymond P. Cobb,* Washington, Ill. TRANSMISSION ARRANGEMENT. Patent dated Mar. 6, 1979. Disclaimer filed Apr. 7, 1986, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claims 1, 2, 4, 9, 10 and 11 of said patent.

4,207,876.—*Larry D. Annis,* Elgin, Ill. COMPRESSION DEVICE WITH VENTILATED SLEEVE. Patent dated June 17, 1980. Disclaimer filed Dec. 6, 1985, by the assignee, *The Kendall Co.*

Hereby enters this disclaimer to all claims of said patent.

4,292,589.—*Stephen D. Bonner,* Houston, Tex. EDDY CURRENT METHOD AND APPARATUS FOR INSPECTING FERROMAGNETIC TUBULAR MEMBERS. Patent dated Sept. 29, 1981. Disclaimer filed Apr. 9, 1986, by the assignee, *Schlumberger Technology Corp.*

Hereby enters this disclaimer to claims 26, 27, 28, 29, 30 and 31 of said patent.

4,309,432.—*Nobuyuki Tanaka,* Tokushima; *Yoichi Nishinakamura,* Ibaragi and *Kazuyuki Nakagawa,* Tokushima, Japan. COMPOSITIONS FOR TREATING GLAUCOMA CONTAINING A CARBOSTYRIL. Patent dated Jan. 5, 1982. Disclaimer filed Apr. 17, 1986, by the assignee, *Otsuka Pharmaceutical Co., Ltd.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

4,356,028.—*Victor T. Bates,* Kenosha, Wis. IN SITU PHOSPHORUS ADDITION TO TANTALUM. Patent dated Oct. 26, 1982. Disclaimer filed Oct. 7, 1983, by the assignee, *Fansteel Inc.*

Hereby enters this disclaimer to claims 2 and 3 of said patent.

4,407,743.—*Shin-Shyong Tseng,* Bridgewater, N.J. NOVEL N,N'-BIS(TRIFLUOROMETHYLSULFONYL)OXAMIDES AND CHEMILUMINESCENT COMPOSITIONS CONTAINING THE SAME. Patent dated Oct. 4, 1983. Disclaimer filed Mar. 27, 1986, by the assignee, *American Cyanamid Co.*

The term of this patent subsequent to Oct. 7, 1997, has been disclaimed.

4,492,782.—*Richard S. Williams,* Bromsgrove and *Terry Daniels,* Oldbury, England. MOULDING COMPOUNDS BASED ON POLYESTER. Patent dated Jan. 8, 1985. Disclaimer filed Apr. 10, 1986, by the assignee, *BIP Chemicals Ltd.*

Hereby enters this disclaimer to claims 1–8 and 10–19 of said patent.

4,517,366.—*Ronnie R. Crenshaw,* Dewitt and *Aldo A. Algieri,* Fayetteville, N.Y. INTERMEDIATES FOR PREPARING 3,4-DIAMINO-1,2,5-THIADIAZOLES. Patent dated May 14, 1985. Disclaimer filed Nov. 20, 1985, by the assignee, *Bristol-Myers Co.*

Hereby enters this disclaimer to claim 6 of said patent.

4,573,081.—*Jereld R. Reeder,* Indianapolis, Ind. FREQUENCY SELECTIVE VIDEO SIGNAL COMPRESSION. Patent dated Feb. 25, 1986. Disclaimer filed Apr. 7, 1986, by the assignee, RCA Corp.

Hereby enters this disclaimer to claims 1–10 of said patent.

Dedication

4,127,028.—*Bruce M. Cox* and *Floyd A. Gonzalez,* Duncan, Okla. CORIOLIS MASS FLOW RATE METERING MEANS. Patent dated Nov. 28, 1978. Dedication filed Oct. 15, 1985, by the assignee, *Micro Motion, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

4,512,164.—*Masao Fukuhara,* Nishimuro, Japan. PIVOTED LATCH NEEDLE. Patent dated Apr. 23, 19 85. Disclaimer and Dedication filed Mar. 24, 1986, by the assignee, *Fukuhara Needle Co. Ltd.*

Hereby disclaims and dedicates to the Public all claims of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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California	Los Angeles Public Library	(213) 612-3273
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Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
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Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 1, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	7-23-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-18-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-17-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	2-01-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-25-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during May 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,441,960 to 3,447,159, inclusive

Plant Patents ..... Numbers 2,882 to 2,889 inclusive

REISSUES

JUNE 17, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,181

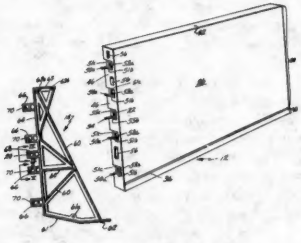
STRUCTURAL FOAM SWIMMING POOL WALL AND BRACE AND METHOD OF ERECTING SAME

Robert L. Glonek, 3256 Rickman, NE., Grand Rapids, Mich. 49505; Paul Kantor, and Loren R. Perry, both of Berrien Springs, Mich., assignors to Robert L. Glonek, Grand Rapids, Mich.

Original No. 4,464,802, dated Aug. 14, 1984, Ser. No. 312,349, Oct. 16, 1981. Application for reissue Feb. 1, 1985, Ser. No. 697,143

Int. Cl.[4] E04H *3/18, 3/16*

U.S. Cl. 4—506 **42 Claims**



1. A pool wall assembly comprising:

a supporting brace;

first and second wall panels *each having a front surface;*

first means for securing said first panel to said brace; and

second means for securing said second panel to at least one of said intersecured brace and first panel, *said front surfaces being aligned with and abutting one another to define a substantially uninterrupted surface,* said second securing means being actuable independently of said first securing means whereby said brace can be secured to only said first panel to facilitate alignment of said brace and first panel prior to securement of said second panel.

40. A pool wall assembly as defined in claim 1 wherein said second securing means includes alignment means for vertically aligning said first and second panels.

Re. 32,182

METHOD FOR SCREENING, SEPARATING, AND REMOVING FIBER BUNDLES, LUMPS, KNOTS AND FOREIGN MATTER FROM AQUEOUS DISPERSIONS USED IN FORMING NON-WOVEN FABRICS BY WET-LAYING

Michael Ring, Warwick, and Peter Angelini, Central Valley, both of N.Y., assignors to International Paper Co., New York, N.Y.

Original No. 4,466,862, dated Aug. 21, 1984, Ser. No. 467,333, Feb. 17, 1983. Continuation of Ser. No. 246,707, Mar. 23, 1981, abandoned. Application for reissue Mar. 11, 1985, Ser. No. 710,596

Int. Cl.[4] D21C *5/18, 5/20*

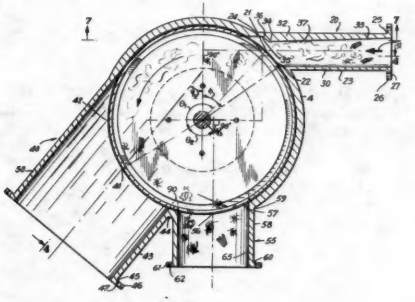
U.S. Cl. 162—55 **3 Claims**

1. Method for screening, separating and removing fiber defects and foreign matter above a prescribed size from a dispersion of thin, long, flexible fibers having length to diameter ratios above 400 to 1, the dispersion intended for use in the formation of non-woven fabrics by wet-laying, the method comprising:

(a) producing a fiber dispersion stream of the thin, long, flexible fibers, the dispersion including a dispersion fluid, disoriented individual fibers, and lumped and tangled fibers;

(b) directing the stream over a substantially linear path to a curvilinear path at an entrance of an annular chamber having sidewalls[,] *and endwalls,* wherein the stream is introduced substantially tangential to the curvilinear path to avoid abrupt changes in stream direction and to avoid turbulence at the entrance;

(c) rotating *at least* the [side] *end* walls to accelerate, throughout the cross-section in the direction of stream flow, the dispersion fluid relative to the disoriented fibers and lumped and tangled fibers to axially align and disperse the disoriented fibers in the stream;



(d) screening the lumped and tangled fibers above a prescribed size from the dispersion by presenting a lateral stream boundary to a screen comprising a plurality of tapered slots through which the disoriented fibers are aligned and accelerated to prevent passage of lumped and tangled fibers having a size above a prescribed value through the screen and permitting passage of other fibers through the screen; and

(e) washing accumulated lumped and tangled fibers prevented passage through the screen with the dispersion fluid and discharging the lumped and tangled fibers from the stream.

Re. 32,183

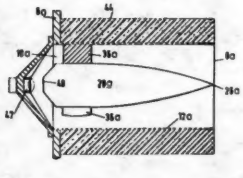
SOUND PROJECTION SYSTEM

Timothy P. Isaacs, Huntington, England, assignor to Turbosound Group Ltd., London, England

Original No. 4,181,193, dated Jan. 1, 1980, Ser. No. 833,873, Sep. 16, 1977. Application for reissue Aug. 2, 1983, Ser. No. 519,752

Int. Cl.[4] G10K *11/00, 13/00*

U.S. Cl. 181—185 **10 Claims**



1. A sound projection system comprising a housing having a

means defining a longitudinally extending acoustic channel, said channel having an acoustically opened front end and an acoustically closed rear end and acoustically closed sides; a loudspeaker carried at the rear of said housing, said loudspeaker having a cone diaphragm defining a part frusto-conical volume and operating into the channel at the rear end of the channel, *said diaphragm having a maximum longitudinal displacement at a center of said diaphragm in response to an audio electrical signal*; and a longitudinally extending member mounted within the channel directly in front of, and in alignment with, the loudspeaker to restrict the free space within the channel, said member having a front portion, which is tapered towards the front of said channel, and a rear portion, which is tapered abruptly towards said loudspeaker and projects into said part frusto-conical volume, terminating with a flat end facing the loudspeaker, said member being supported by a strut fixedly attached at one end to the inner wall of said housing extending radially inward and attached fixedly to said member at the other end [.], *said rear portion of said member being spaced away from said diaphragm substantially in excess of the maximum longitudinal displacement of the center of said diaphragm.*

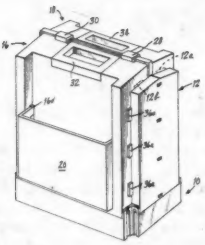
Re. 32,184
SEWING BOX

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Original No. 4,504,000, dated Mar. 12, 1985, Ser. No. 465,791, Feb. 11, 1983. Application for reissue Apr. 26, 1985, Ser. No. 727,929

Int. Cl. A45F *3/48*

U.S. Cl. 223—107 **12 Claims**



7. A sewing box comprising:

a central tray;

left and right sidetrays, each secured to the central tray to pivot relative thereto between a closed position, in which it extends upwardly at least in part above the central tray, and an open position, in which it extends laterally at least in part away from the central tray;

front and back spool panels, each secured to the central tray to pivot relative thereto between a closed position, in which it extends upwardly at least in part above the central tray, and an open position, in which it extends laterally at least in part away from the central tray;

wherein when in their closed positions the sidetrays and the spool panels form, together with the central tray, a substantially closed box, and when in their open positions form, together with the central tray, an open-top, cross-shaped structure;

wherein each of the central tray, the sidetrays and the spool panels is a respective integrally molded unit made of a thermoplastic material, each of the central tray and the sidetrays has respective ribs which are integrally molded therewith and divide it into a number of compartments, each spool panel has a number of spool spindles which are integrally molded therewith and extend toward the other spool panel when the spool panels are in their closed positions, and the sidetrays have respective lids pivotally mounted thereon to move between respective closed positions, in which they close the compartments of the respective sidetrays, and open positions, in which they allow access to the compartments of the respective sidetrays;

a respective slide lock mounted on each spool panel to move between an open position and a closed position, wherein when the spool panels are in their closed positions and a slide lock mounted on one of them is moved from its open toward and into its closed position it engages the other spool panel to thereby keep the spool panels in their closed positions, and wherein each slide lock engages only one spool tray when in its open position, whereby the spool panels can move from their closed positions toward their open positions when both slide locks are in their open positions; and

a pair of handles, each mounted on a respective one of the spool panels to pivot relative thereto between an open position and a closed position, wherein each spool panel has a handle recess which receives the respective handle when it is in its closed position such that the handle is substantially flush with the surface of the respective spool tray into which the respective recess is formed, wherein the two handles extend laterally away form each other when in their closed positions and extend upwardly next to each other when in their open positions;

means for snap-mounting said handles on the respective spool panels, and interlock means integrally formed together with said sidetrays and spool panels for securing the sidetrays to the spool panels when the spool panels are moved from their open positions to their closed positions while the sidetrays are in their closed positions;

wherein the two sidetrays are identical to each other and are interchangeable, and the two spool panels also are identical to each other and are interchangeable, and the sidetrays and the spool panels are secured to the central tray by snaplocking connections.

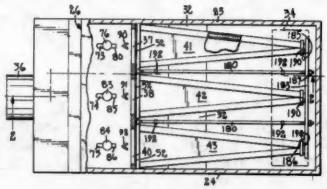
Re. 32,185
SELF-CLEANING PULSED AIR CLEANER

George A. Copley, Farmington, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Original No. 4,364,751, dated Dec. 21, 1982, Ser. No. 338,308, Jan. 11, 1982. Division of Ser. No. 195.873, Oct. 10, 1980, Pat. No. 4,331,459. Application for reissue Dec. 19, 1984, Ser. No. 683,406

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—96 **4 Claims**



3. The method of removing particles of solid matter from air which comprises:

(a) supplying a stream of uncleaned air to one end of a filter assembly having flat filter elements defining chambers, with a motion having a generally horizontal component parallel to the surface of the filter elements so that particles are initially collected on said surfaces and the air passes through the filter elements;

(b) supplying reverse air pulses to said chambers in a repeating cycle to dislodge the particles briefly from the surface of each adjacent filter element to enable them to migrate therealong with the air stream in a downstream direction toward a scavenge outlet located at the remaining end of the filter assembly; and

(c) continuously withdrawing at said scavenge outlet said air carrying the migrated particles.

Re. 32,186

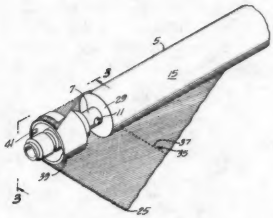
FLUID TRANSFER APPARATUS AND METHOD OF FLUID TRANSFER

Donald J. Bentley, Newport Beach, Calif., assignor to American Hospital Supply Corp., Evanston, Ill.

Original No. 4,240,907, dated Dec. 23, 1980, Ser. No. 4,486, Jan. 18, 1979. Continuation of Ser. No. 813,455, Jul. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 708,074, Jul. 23, 1976, abandoned. Application for reissue Dec. 23, 1982, Ser. No. 452,848

Int. Cl.[4] B01E *13/00*

U.S. Cl. 210—646 4 Claims



3. A [helical flow dialyzer] *fluid transfer apparatus* comprising:

a [dialyzer] housing disposed about a central core, said core including a tubular [dialyzate] *fluid* inlet and a tubular [dialyzate] *fluid* outlet, both said [dialyzate] *fluid* inlet and outlet being provided with a plurality of apertures and being joined by a cylindrical section of said central core for preventing [dialyzate] *fluid* flow through said cylindrical portion and for forcing [dialyzate] *fluid* inlet and outlet;

an annular blood inlet chamber and an annular blood outlet chamber formed within said [dialyzer] housing about said tubular [dialyzate] *fluid* inlet and outlet, respectively, said inlet chamber having a tangential inlet nozzle and said outlet chamber having a tangential outlet nozzle;

a belt made up of similarly [helically] oriented semipermeable tubules, [wrapped about] *surrounding* said central core, opposed ends of said tubule belt being secured in an annular ring of potting compound formed about a portion of said [dialyzate] *fluid* inlet and outlet such that said [dialysate] *fluid* inlet and outlet apertures are located within an enclosure formed by said [dialyzer] housing, said central core and said annular potting rings, said annular rings forming a portion of said blood inlet and blood outlet chambers, said ends of said hollow fibers passing through said annular rings for communication with said blood inlet and outlet chambers; and

a compression means positioned near the juncture of said [dialyzate] *fluid* inlet and said central core cylindrical portion between said housing and said central core and about said tubules for increasing the packaging density of said tubules in the area adjacent said compression means.

Re. 32,187

SYSTEM FOR DIGITALLY TRANSMITTING AND DISPLAYING TEXTS ON TELEVISION SCREEN

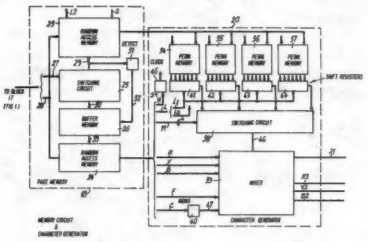
Jean F. Barda, Gentilly; Roger Brusq, Betton; Bernard Marti, Noyal sur Vilaine, and Alain Poignet, Rennes, all of France, assignors to Etablissement Public de Diffusion dit "Telediffusion de France", Montrouge, France

Original No. 4,213,124, dated Jul. 15, 1980, Ser. No. 833,157, Sep. 14, 1977. Application for reissue Jun. 3, 1981, Ser. No. 270,097

Claims priority, application France, Sep. 22, 1976, 76 29034

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—706 4 Claims



1. A receiver for a teletext system for digitally transmitting and displaying texts on a television screen, wherein a transmitter station broadcasts signals representing said text, said signals being in the form of data packs, sent over several channels, the data packs from different channels being randomly time multiplexed, [each pack comprising a prefix signal for enabling a receiver to accept the data packs received over at least a selected channel and to reject data packs received over other channels,] each of said data packs including the transmission in sequence of eight-bit words comprising [in addition to said prefix,] page flags followed by page numbers and row flags followed by row numbers, escape eight-bit words followed by type identity eight-bit words, type identity eight-bit words, followed by a sequence of coded words identifying characters which are to be displayed in the same type which is identified by the identity words as determined by the preceding type identity words, said words receiver comprising first random access memory means for storing the coded character words at certain addresses, second random access memory means for storing the type identity words at the same certain addresses as the addresses of corresponding character words stored in the first random access memory, means for reading the words stored in the first random access memory means and at the same time as the read out if the words stored in the second random access memory, thereby simultaneously selecting a character and a type identity, and permanent memory means responsive to the read out of said second random access memory means for giving the shape of the characters read out from the first random access memory.

Re. 32,188

COLOR TELEVISION RECEIVER COMPRISING AT LEAST ONE INTEGRATED CIRCUIT FOR THE LUMINANCE SIGNAL AND THE CHROMINANCE SIGNALS

Peter M. Flamm, Freiburg, and Leslie Miskin, Gundelfingen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Original No. 4,270,139, dated May 26, 1981, Ser. No. 101,657, Dec. 10, 1979. Application for reissue May 25, 1983, Ser. No. 498,029

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854238

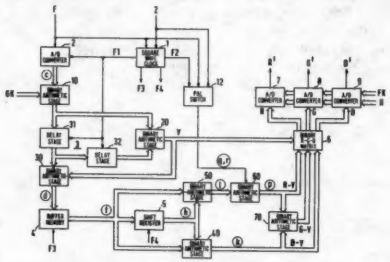
Int. Cl.[4] H04N 9/50

U.S. Cl. 358—23 **23 Claims**

9. An arrangement for producing from a composite color analog signal, a plurality of color information digital signals, said arrangement comprising:

means responsive to said analog signal for generating first digital signals having a predetermined relationship carried by said composite color analog signals; and

means for processing said first digital signals to generate said color information digital signals, said processing means comprises: means responsive to control signals and to said first digital signals for generating intermediate digital signals; and first processing means for processing said intermediate digital signals to generate said color information digital signals, said first processing means comprises first means for generating first ones of said plurality of color information digital signals by acting on a first set of



said intermediate digital signals and a second set of said intermediate digital signals in a predetermined manner, said first set and second successive set of said intermediate digital signals being successive sets of said intermediate digital signals.

PLANT PATENTS

GRANTED JUNE 17, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,749

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 24, 1984, Ser. No. 653,352

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by unusually stable currant red flowers of good exhibition form attractively set off by leathery green foliage.

5,750

BORCHARD AVOCADO TREE

Edward C. Borchard, 701 E. Gonzales Rd., Oxnard, Calif. 93030

Filed Feb. 24, 1984, Ser. No. 583,346

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—44 **1 Claim**

1. A new and distinct variety of avocado substantially as shown and described, characterized particularly by its usefulness as a root stock and in prevention of chlorosis in soil conditions where trees are prone to become chlorotic.

5,751

***BANISTERIOPSIS CAAPI* (cv) 'DA VINE'**

Loren S. Miller, 1788 Oak Creek Dr., Apt. 407, Palo Alto, Calif. 94303

Continuation of Ser. No. 266,114, May 21, 1981, abandoned. This application Nov. 7, 1984, Ser. No. 669,745

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. The new and unique *Banisteriopsis caapi* plant substantially as described and illustrated.

PATENTS

GRANTED JUN. 17, 1986

ERRATA

For CLASS	See PATENT NO.
139–011	4,595,089
384–015	4,595,244
433–225	4,595,376
522–029	4,595,471
522–099	4,595,472
558–414	4,595,540

PATENTS

GRANTED JUNE 17, 1986

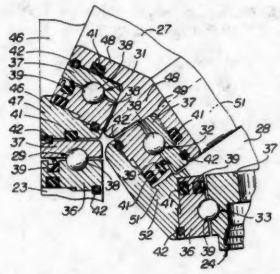
GENERAL AND MECHANICAL

4,594,734

SHOULDER AND HIP JOINT FOR HARD SPACE SUITS

Hubert C. Vykukal, Los Altos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,192
Int. Cl.[4] A62B *17/00;* **F16L** *11/18*
U.S. Cl. 2—2.1 A **26 Claims**



1. A joint for a hard space suit comprising,

consecutive first, second and third hard sections, each said section having a proximal and a distal end, the ends of each said section being disposed at a solid geometric angle so that they converge,

a first bearing having a first axis of rotation and a first plane perpendicular to said first axis through the middle of said first bearing, said first axis intersecting said first plane at a first point, said first bearing being fixed to the proximal end of said first section,

a second bearing having a second axis of rotation and a second plane perpendicular to said second axis through the middle of said second bearing, said second axis intersecting said second plane at a second point, said second bearing being fixed both to the distal end of said first section and the proximal end of said second section,

a third bearing having a third axis of rotation and a third plane perpendicular to said third axis through the middle of said third bearing, said third axis intersecting said third plane at a third point, said third bearing being fixed both to the distal end of said second section and the proximal end of said third section,

a fourth bearing having a fourth axis of rotation and a fourth plane perpendicular to said fourth axis through the middle of said fourth bearing, said fourth axis intersecting said fourth plane at a fourth point, said fourth bearing being fixed to the distal end of said fourth section,

the axes of rotation of at least three said bearings intersecting the said plane of an adjacent bearing at the same point at which the axis of rotation of that adjacent bearing intersects its said plane, whereby the interiors of said sections provide a minimal envelope for a human shoulder or hip.

4,594,735

COMBINATION PONCHO AND TENT

Gerald Rolf, 4622 Holland St., Wheatridge, Colo. 80033, and John C. Wickersheim, 4325 Easley Rd., Golden, Colo. 80401

Filed Jan. 3, 1986, Ser. No. 815,947
Int. Cl.[4] A41D *3/08*
U.S. Cl. 2—89 **10 Claims**

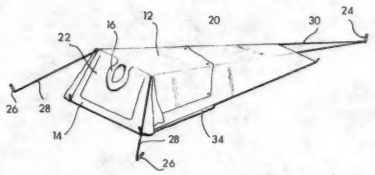
10. A combination tent and poncho comprising:

(a) A poncho;

(b) A tent comprising an axially tapered collapsible sleeve with its larger end attached to the interior surface of the poncho;

(c) An opening through the poncho into the tapered sleeve;

(d) A securing flap attached to the poncho, that folds over the tapered sleeve in its collapsed state with the free end of the flap removably fastened to the poncho;



(e) A number of tent poles for supporting the peak of the tent near its larger end, in its assembled state;

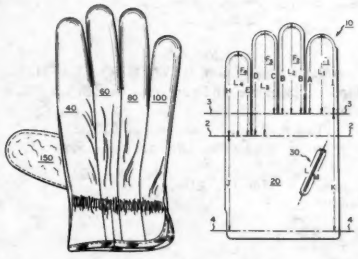
(f) Means for securing the tapered end of the tent to ground, in its assembled state.

4,594,736

CURVED CLUTE-CUT GLOVE CONSTRUCTION

John R. Connelly, Deerfield, Ill., assignor to Wells Lamont Corporation, Chicago, Ill.

Filed Aug. 27, 1984, Ser. No. 644,752
Int. Cl.[4] A41D *19/02*
U.S. Cl. 2—163 **5 Claims**

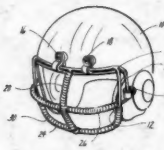


1. A Clute-cut glove construction having in part a bottom hand piece including an index, middle, fourth and little finger pieces of stretchable material and joined to a palm piece, and a separate back piece for each of the said finger pieces with each back piece having a finger portion and a hand portion, characterized in that said finger portion of each of the back pieces has a length that is longer than the unstretched length of its corresponding finger piece of said bottom hand piece and a width that is wider than the unstretched width of its corresponding finger piece of said bottom hand piece, the finger pieces of said bottom hand piece being connected to the corresponding finger portions of each of the back pieces with their stretched length and width distances equal to the associated unstretched length and width distances of the corresponding finger portions of each of the back pieces, whereby said glove construction will have a curved configuration corresponding to that of a hand in a relaxed state after the finger portions of the back pieces have been sewn to the corresponding finger pieces.

4,594,737
FOOTBALL HELMET FACE MASK

John D. Butash, 13644 Kingston, Oak Park, Mich. 48237

Filed Jan. 23, 1985, Ser. No. 694,071
Int. Cl.[4] A42B 1/08
U.S. Cl. 2—424 6 Claims

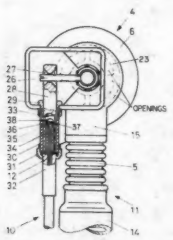


1. In combination with a football helmet having an opening for exposing the user's face, a mask including:
an elongated member spanning said opening;
means connecting opposite ends of the elongated member to opposite sides of the opening;
a plurality of beads mounted along the elongated member, each of said beads comprising;
a body having an opening for receiving the elongated member; and
a structure mounted on the body for closing one side of said opening such that the body and the structure form a bead slideably rotatably mounted on the elongated member.

4,594,738
DRAIN AND OVERFLOW DEVICE FOR BATHTUBS

Stephan Gebert, La Porte, Ind., assignor to Geberit AG, Jona, Switzerland

Filed Aug. 23, 1983, Ser. No. 525,537
Claims priority, application Switzerland, Sep. 20, 1982, 5545/82
Int. Cl.[4] E03C 1/24
U.S. Cl. 4—199 3 Claims

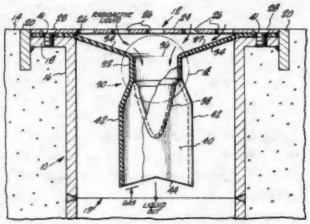


1. Drain and overflow device for bathtubs having a drain valve (1) and a turn knob (6) adjacent to an overflow (4), a body (8) of said drain valve being lifted into open position by rotation of said turn knob by means of a Bowden draw tube (10), wherein
(a) a conduit (11) for said overflow is formed at least partly as a bellows (5) so as to enable adaptation of the length and orientation of said overflow to bathtubs of diverse dimensions;
(b) a flexible Bowden cable (12) being entirely contained within said Bowden draw tube (10) and being operably rotatably connected to a rigid, axially slidable cable bolt (28) having an axial bore (33) containing a bearing (34) to which said Bowden cable (12) is attached, said bearing (34) being rotatable relative to said cable bolt (28), whereby twisting of said Bowden cable (12) upon rotation of said cable bolt (28) is obviated.

4,594,739
PROTECTIVE DRAIN

Brian R. Watts, 18512 S. Bainbrook, Cerritos, Calif. 90701, and Robert E. Carlton, 1019 Ocean Ave., "C" , Seal Beach, Calif. 90740

Filed May 21, 1984, Ser. No. 612,246
Int. Cl.[4] A47K 1/14; E03C 1/26
U.S. Cl. 4—287 5 Claims

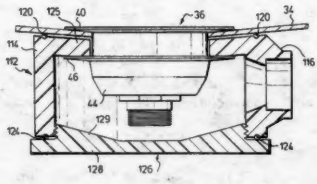


1. A liquid floor drain comprising:
(a) a housing having an inlet and an outlet;
(b) a one-way valve for permitting flow only from the inlet to the outlet, the valve comprising:
(i) a tubular body having an entrance and an exit, the body having oppositely disposed parallel flexible wall portions positioned to be held in contact for closing the exit under the influence of pressure on the exterior of the wall portions when such pressure is not less than the pressure within the body; and
(ii) a flange extending radially outwardly from the entrance of the body for suspending the body within the housing; and
(c) means for sealingly clamping the flange to the housing, wherein the top surface of the flange is concave for directing any liquid entering the inlet to the entrance.

4,594,740
SINK TRAP ASSEMBLY

Antoine Tseronakis, 165 Morton Way, Brampton, Ontario, Canada L6Y 2P7

Filed Dec. 18, 1984, Ser. No. 682,960
Int. Cl.[4] E03C 1/26; F16K 13/00
U.S. Cl. 4—288 1 Claim



1. A sink trap assembly comprising a strainer having a tubu-

lar inner portion with an outwardly directed flange at an upper end and an external screw thread on a lower end, said strainer also having a tubular outer portion with an outwardly directed flange at an upper end and an internal screw thread at a lower end, the tubular inner portion of the strainer being fittable in a sink opening with the outwardly directed flange of the tubular inner portion engaging an upper surface of the sink and with the lower end of the tubular inner portion projecting downwardly through the sink opening, and the tubular outer portion being screwable onto the lower end of the tubular inner portion beneath the sink,

said sink trap assembly also comprising an upper vertical tubular part having a side wall with a tubular outlet securable to a horizontal outlet pipe, an open upper end, and a lower open end to enable the upper tubular part to be installed by upward movement to position the upper end in sealing engagement with a lower surface of a sink around the inner strainer portion with the outlet of the tubular part being directed in any desired horizontal direction, the upper end of the upper tubular part having an inwardly directed flange positionable between the lower surface of the sink and the outwardly directed flange on the outer portion of the strainer, when the outer strainer portion is screwed onto the inner strainer portion beneath the sink, to retain the tubular part in sealing engagement with the lower surface of the sink, the lower open end of the tubular part being larger than the outwardly directed flange of the outer strainer portion to enable the outer strainer portion to be engaged with the inner strainer portion by upward movement through the lower open end of the tubular part,

and a lower part sealingly engageable with the lower open end of the upper tubular part to close said lower open end, the lower part and the lower end of the tubular part having cooperating screw thread means to enable the lower part to be detachably secured to the lower end of the tubular part.

4,594,741

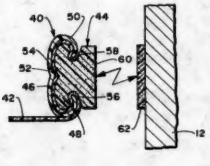
SHOWER CURTAIN RETAINER APPARATUS

Richard L. Payne, 561 Tico Rd., Ojai, Calif. 93023

Continuation-in-part of Ser. No. 551,113, Nov. 14, 1983, abandoned. This application Dec. 13, 1984, Ser. No. 681,431

Int. Cl.⁴ A47K *3/14*

U.S. Cl. 4—558 **1 Claim**



1. In combination with a bathing enclosure, an access opening providing access into said bathing enclosure, said access opening terminating in side walls, a curtain positioned in said access opening, said curtain being movable between an open position and a closed position, said open position permitting entry by a human being through said access opening, said closed position forming a substantially watertight barrier between said bathing enclosure and the ambient, a retainer apparatus comprising:

means attached to both said curtain and said side walls for maintaining said curtain in said closed position, said means including magnets, said magnets being formed of flexible plastic impregnated with magnetic particles and being formed into elongated first strips and second strips, each said first strip having a contact surface, an opposing surface and a pair of lateral walls extending between said contact surface and said opposing surface, each said lateral wall and said opposing surface having a recess therein, with a rounded end being formed between each said lateral wall recess and said opposing surface recess, a clip having a pair of longitudinal free edges inturned toward each other and a longitudinal protuberance, a second said strip being mounted on each said side wall, each said second strip being attached to a lateral edge of said curtain by placing said curtain over at least the recesses of said first strip, said clip being flexible and having said free edges forced over said rounded ends into engagement with said lateral wall recesses with said protuberance extending into said opposing wall recess to provide a mating clamp of said curtain between said clip and said first strip, said first and second strips being placed into contact to maintain said water tight barrier.

4,594,742

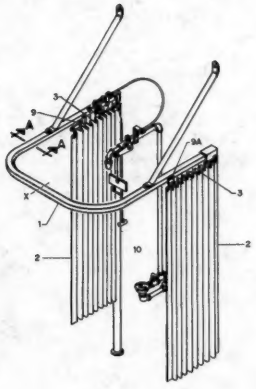
AUTOMATICALLY CLOSING MODESTY CURTAIN

Warren L. Zeigler, Midland, and Roy F. Ziegler, Freeland, both of Mich., assignors to Tri City Laboratory Specialists, Inc., Midland, Mich.

Filed Dec. 9, 1982, Ser. No. 448,417

Int. Cl.⁴ A47K *3/22*

U.S. Cl. 4—607 **1 Claim**



1. A safety shower having at least one movable curtain for enclosing a person, a support means for said curtain, a curtain moving mechanism, a non-electrical drive means consisting of a dropping dead weight to which the curtain moving mechanism is attached, said curtain moving mechanism consisting of a cable attached by one of its ends to said dead weight, pulleys for carrying and assisting said cable and at least one lead roller assembly attached to said cable, a locking means for locking the curtain in the open position, a handle on said safety shower for unlocking the locking means and actuating the non-electrical drive means for the curtain-moving mechanism to thereby cause the curtain to automatically close.

4,594,743

AIR SUPPORT BED

Charles C. Owen, Chicago; Charles B. Owen, Long Grove, both of Ill., and Hsi-Tao (Steve) Lin, Taipei, Taiwan, assignors to Siesta Corp., Northbrook, Ill.

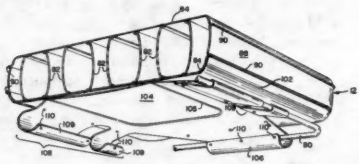
Filed Jul. 10, 1984, Ser. No. 629,350

Int. Cl.⁴ A47C *19/12, 17/64, 27/08*

U.S. Cl. 5—111 **19 Claims**

1. A portable and collapsible bed comprising an elongated, generally rectangular tubular frame and an inflatable mattress, said inflatable mattress including a main hollow flexible body adapted to be inflated and having a peripheral configuration

conforming generally to said tubular frame, an attaching member joined to said main body on one side thereof, said attaching member including flap-defining means providing a plurality of flaps which extend freely outwardly toward the periphery of said main body from permanent connection means spaced substantially inwardly of the periphery of said main body, said attaching member further including an intermediate layer of



material underlying said main body and joined to said main body at the periphery thereof, said flap defining means comprising a further layer of material underlying said intermediate layer and joined to said intermediate layer inwardly of the periphery of said main body to provide said permanent connection means, and connector means on outer free ends of each of said flaps for releasable connection to portions of said tubular frame.

4,594,744

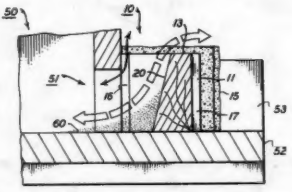
HONEYBEE ENPOLLINATING SYSTEM USING MULTI-PURPOSE BEEHIVE ENTRANCE DEVICE

Thomas E. Ferrari, 2028 W. Seneca St., Lodi, N.Y. 14860

Filed Jan. 31, 1985, Ser. No. 697,043

Int. Cl.[4] A01K *47/06*

U.S. Cl. 6—4 R **20 Claims**



1. A beehive entrance modifier formed as an elongated body that, when resting on a bottom board of said hive, extends over the length of said hive entrance, said modifier comprising:

a. in a bee-enpollinating position, said body closing said hive entrance except for a vent region and a bee passageway substantially narrower than said hive entrance;

b. said bee passageway being recessed far enough into a face of said body confronting said hive entrance to accommodate both incoming and outgoing bees;

c. said passageway being formed as an inclined ramp sloping into said hive entrance from a top of said body above said hive entrance downward to said bottom board so that bees travel up and down said ramp;

d. said body around said passageway containing and sheltering pollen poured into said passageway to rest on said bottom board in said hive entrance for enpollinating both incoming and outgoing bees; and

e. said vent region extending along a substantial length of said hive entrance outside said passageway wherein said confronting face of said body is spaced from said hive entrance by a venting distance too small for a bee to pass through.

4,594,745

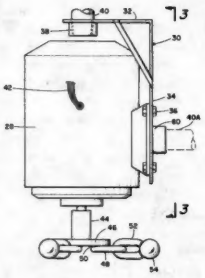
APPARATUS FOR CLEANING CHIMNEYS

Larry D. Pierce, Rte. 2, Box 155, Pawhuska, Okla. 74056

Filed Jan. 22, 1985, Ser. No. 693,354

Int. Cl.[4] F23J *3/00*

U.S. Cl. 15—92 **4 Claims**



1. A portable chimney sweep cleaning device which comprises:

motor having a shaft with a longitudinal axis;

a rod;

a frame for holding said motor, said frame having a first rod connector for connecting said rod to said frame so that said rod extends in substantially the same direction as said axis of said shaft and a second rod connector for connecting said rod such that said rod is perpendicular to said axis;

a plurality of fixed chain lengths fixed to said shaft in a plane perpendicular to said axis;

at least one second chain link connected to each said fixed chain link in an articulated manner;

a ball fixed to the outer end of said second chain link and extending beyond the periphery of said frame.

4,594,746

WINDSHIELD WIPER UNIT

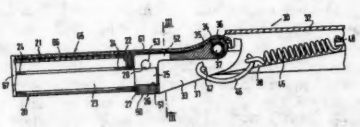
Kurt Bauer, Ingersheim; Reinhard Edele, Bietigheim-Bissingen; Bruno Egner-Walter, Heilbronn; John M. Longney, Sachsenheim; Eckhardt Schmid, Brackenheim; Wolfgang Scholl, Gemmrigheim; Walter Wagner, Heilbronn; Anton Epple, Rottenberg; Hans Trube, Herrenberg; Martin Pfeiffer, Stuttgart, and Josef Berger, Wolfschlugen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen and Daimler-Benz, Stuttgart, both of, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,412

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331309

Int. Cl.[4] B60S *1/34*

U.S. Cl. 15—250.21 **35 Claims**



1. A windshield wiper unit comprising:

a housing which is driven to and fro;

a cylindrical slide supported in said housing and movable in its longitudinal direction;

a wiper arm;

said wiper arm including a fastening part for fastening said wiper arm to an end section of said slide, said fastening part having a recess directed in the longitudinal direction of said wiper arm, said recess being adapted to receive said

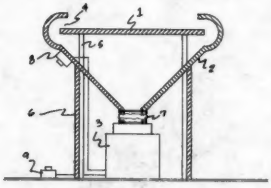
end section in said longitudinal direction of said slide, said end section being jammed into said recess.

4,594,747

WORK SUPPORT WITH CLEANING STRUCTURE

Mary A. Dempsey, 171 Brickyard Rd., Cranbury, N.J. 08512

Filed Nov. 8, 1984, Ser. No. 669,586
Int. Cl.[4] A47L *7/00*; A61D *3/00*
U.S. Cl. 15—301 **9 Claims**



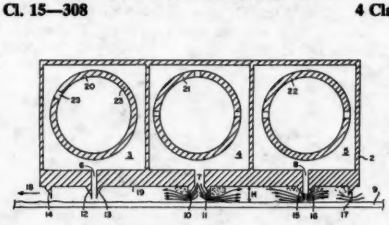
1. A self-cleaning work support, comprising:
means for providing a suction force;
a table work surface, for supporting a work object;
table surface support means, connected beneath said table work surface, for supporting said table work surface spaced above a floor surface; and,
a suction directing means, supported slightly above and over to encompass a peripheral edge of said table work surface, and extending downwardly forming an exhaust funnel, connected to said suction providing means, for directing a suction force from said suction providing means downwardly onto the top surface of said table work surface between the peripheral edge of said table work surface and said suction directing structure, whereby removed portions of said work object are drawn away from said table work surface by said suction force.

4,594,748

APPARATUS FOR CLEANING PARTICLES FROM A WEB

Kjell Warfvinge, Lund, Sweden, assignor to AB Kelva, Lund, Sweden

Filed Dec. 8, 1982, Ser. No. 447,831
Claims priority, application Sweden, Dec. 9, 1981, 8107374
Int. Cl.[4] A47L *5/14, 5/38*
U.S. Cl. 15—308 **4 Claims**



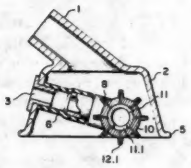
1. Apparatus for directing an air flow against the surface of a moving web, with sufficient velocity to penetrate a boundary layer adjacent the surface of the web and for creating sufficient turbulence in the air flow to produce microvibrations in the web for cleaning particles therefrom, comprising:
a box positioned adjacent the surface of a web to be cleaned, said box including at least first and second chambers extending across the width of the web to be cleaned and transversely to the direction of motion of the web to be cleaned, said first and second chambers including first and second walls, respectively, each wall facing and being generally parallel to the surface of the web to be cleaned;
first and second elongated slits extending along said first and second walls, respectively, said first and second slits each extending generally across the width of the web to be cleaned and being spaced apart in the direction of the motion of the web to be cleaned, said first and second slits having respective axes perpendicular to said first and second walls, respectively, and thus perpendicular to the surface of the web to be cleaned;
means to provide an elevated air pressure in said first chamber;
means to provide a negative air pressure in said second chamber;
first and second blades positioned on said first wall adjacent and on opposite sides of said first elongated slit and extending from said first wall toward the surface of the web to be cleaned, said first and second blades each being generally triangular in cross-section, each having a first surface inclined away from said axis of said first slit, and each having a second surface, said first and second surfaces of each of said first and second blades intersecting at corresponding first and second edges on opposite sides of said first slit and adjacent the web to be cleaned, said first and second blades cooperating to form a diverging nozzle for elevated pressure air in said first chamber, said first and second edges being located sufficiently close to the surface of the web to be cleaned that elevated pressure air passing through said diverging nozzle penetrates the boundary layer at the surface of the web and is deflected by the web to pass beyond said first and second blades to create turbulent air flow to produce micro-vibration of the web to be cleaned and to loosen particles at the surface of the web;
third and fourth blades positioned on said second wall adjacent and on opposite sides of said second elongated slit and extending from said second wall toward the surface of the web to be cleaned, said third and fourth blades each being generally triangular in cross-section, and each having a first surface generally parallel to said axis of said second slit and having a second surface inclined toward said axis of said second slit, said first and second surfaces of each of said third and fourth blades intersecting at corresponding third and fourth edges on opposite sides of said second slit and adjacent to the web to be cleaned, said third and fourth edges being located sufficiently close to the surface of said web to create turbulent air flow to further loosen particles at the surface of the web as the air from said first slit flows along the web to be cleaned and into said second slit.

4,594,749

VACUUM CLEANER WITH AIR JET ASSIST

Dale G. Waterman, P.O. Box 1492, LaCrosse, Wis. 54601

Filed Nov. 13, 1984, Ser. No. 670,045
Int. Cl.[4] A47L *9/08*
U.S. Cl. 15—345 **4 Claims**



1. A vacuum head having a downwardly open hood having an air supply inlet and an outlet connectable to a source of vacuum, a rotor with a plurality of air nozzles, support means for rotatably supporting said rotor within the cavity of said hood and including valve means for connecting said air supply inlet to said rotor whereby air is discharged through the nozzles as a result of a pressure differential between the inside of the hood and outside of the hood at a predetermined position

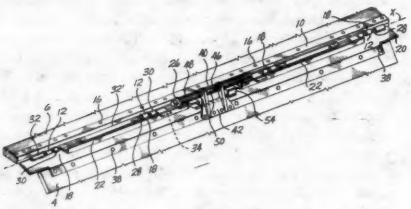
as said rotor is rotated during use on a supporting surface and wherein said support means includes a hollow hub and wherein said rotor includes an elongated tube with a pluraltity of protruding nozzles wherein said nozzles are arranged in longitudinal rows and said valve means comprises a longitudinal slot in said hub registerable, in sequence with each row of nozzles to afford discharge of air from said nozzles to stir up debris to be recovered by the vacuum in said hood.

4,594,750

RELEASABLE HINGE WITH SPRING BIASED PIN MOVING MECHANISM

Norman J. Carcas, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 16, 1984, Ser. No. 672,364
Int. Cl.[4] E05D *7/10*
U.S. Cl. 16—229 **30 Claims**



1. A separable hinge mechanism comprising:

a first portion including a plurality of hinge knuckles spaced along a common axis, each such knuckle having an axial passageway therethrough;

a second portion that is pivotable with respect to said first portion about said axis and that includes an integral plate-like member, and a plurality of hinge knuckles each of which is attached to said member; said hinge knuckles of said first and second portions together defining a plurality of axially spaced hinge stations;

an axially elongated pin moving member that is laterally spaced from, extends parallel to, and is slidable along said axis;

a plurality of hinge pins, one corresponding to each hinge station, each such pin being attached to the elongated member to slide therewith and into an out from the passageway in a corresponding knuckle on said first portion;

mounting means for slidably mounting the elongated member on the plate-like member; said mounting means including a first spring abutment laterally spaced from the pins and attached to the elongated member, and a second spring abutment spaced from said first abutment in one direction along said axis;

a spring located between said abutments and positioned to be compressed by sliding movement of the elongated member and said first abutment in said direction; and

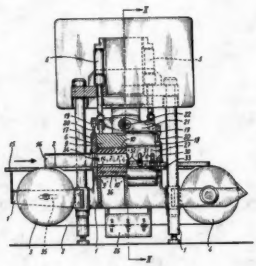
release means for sliding the elongated member in said direction against the force of the spring to slide the pins out of the passageways to in turn disconnect said first and second portions.

4,594,751

DEVICE FOR DEBONING MEAT

Gerardus H. J. Ketels, Grave, Netherlands, assignor to Protecon B.F., Netherlands

PCT No. PCT/NL82/00024, § 371 Date Mar. 8, 1983, § 102(e) Date Mar. 8, 1983, PCT Pub. No. WO83/00276, PCT Pub. Date Feb. 3, 1983
PCT Filed Jul. 14, 1982, Ser. No. 486,948
Claims priority, application Netherlands, Jul. 15, 1981, 8103360; Jan. 11, 1982, 8200076
Int. Cl.[4] A22C *17/04*
U.S. Cl. 17—1 G **29 Claims**



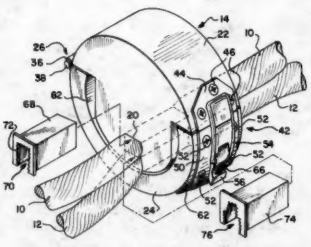
1. In a press for compressively removing meat from a piece of bone with meat attached comprising a pair of relatively movable platens supported for relative reciprocation and adapted to receive a piece of bone with meat attached therebetween, the improvement comprising at least one of said platens having a first portion thereof conforming in shape generally to the shape of said bone, and a second surrounding portion, said first portion being adapted to apply a lesser force for a given degree of press travel than said second portion for applying the compressive force substantially only to the meat without crushing the bone for shearing the meat from the bone while held in said press.

4,594,752

CABLE OR ROPE CONNECTION INCLUDING CLAMP DEVICE

Ronald S. Garner, Sr., P.O. Box 545, Dayton, Ohio 45402

Filed Oct. 12, 1984, Ser. No. 660,342
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—132 R **17 Claims**



1. A clamp device for clamping together cables or ropes, comprising:

an upper jaw member having a tongue portion with a first arcuate surface at an end thereof, said tongue portion defining an open ended engagement slot extending inwardly from said first arcuate surface,

a lower jaw member defining a second arcuate surface,

hinge means, attaching together said upper jaw member and

said lower jaw member, said hinge means permitting said upper and lower jaw members to be pivoted apart to an open position such that the end of said slot is open and ropes or cables may be inserted thereinto, and permitting said upper and lower jaw members to be pivoted together to a closed position such that said first and second arcuate surfaces are in close proximity, and such that the end of said slot is bridged by said lower jaw member thereby retaining ropes or cables in said slot, and

latch means for holding said upper and lower jaw members in said closed position, whereby a plurality of ropes or cables may be clamped together within said slot.

4,594,753

SEPARABLE SLIDE FASTENER

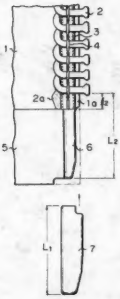
Hiroshi Yoshida, and Yoshiharu Yamaguchi, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,797

Claims priority, application Japan, Sep. 27, 1982, 57-145927[U]

Int. Cl.⁴ A44B *19/36*

U.S. Cl. 24—433 **3 Claims**



1. A separable slide fastener comprising:

a pair of fastener stringers each of which has a fastener tape, a fastener element in the form of a coil fixedly sewn on said tape along a vertically extending side margin of said fastener stringer, a core cord threaded through said fastener element and disposed laterally inward of the side margin of said fastener stringer, reinforcing film means attached to a lower end portion of said fastener stringer and having a core portion of relatively larger thickness than that of said fastener tape formed about an extension of said core cord beneath said fastener element, said core portion defining a vertically extending further side margin beneath said fastener element, the side margin of said fastener stringer disposed laterally outwardly of the further side margin, and a stepped portion on said fastener stringer extending laterally between said side margins and lengthwise disposed between the lowermost end of said fastener element and the uppermost end of said core portion;

a pair of bar members, each having a substantially U-shaped sidewall configuration in cross-section, for sliding over said core portions respectively and being fixedly secured thereto, each bar member having an engagement groove in one end of one said sidewall open to said fastener element such that said engagement groove is guided over said stepped portion until stopped by a lowermost end of said engagement groove; and

a box attached to said bar members for closing together lower ends of said bar members.

4,594,754

CLAMP FOR HOLDING SHEET ARTICLES

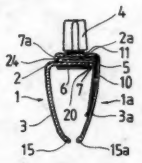
Victor R. Spicer, Auckland, New Zealand, assignor to Planhorse International (NZ) Limited, Auckland, New Zealand

Filed Jun. 11, 1984, Ser. No. 619,179

Claims priority, application New Zealand, Jun. 13, 1983, 204550

Int. Cl.⁴ B42F *1/00*

U.S. Cl. 24—536 **2 Claims**



1. In a clamp for holding one or more sheet articles of the type having a pair of jaws, each jaw in cross-section having a substantially flat base, a flange depending from the base at one end and a gripping leg depending from the other end, the gripping leg being substantially at right angles to the base where it attaches to the base and the gripping leg inclined inwardly to an outer end so that the outer end is substantially underneath the middle of the base with the gripping legs converging together, one of the bases being mounted uppermost above and pivotable about the other lowermost base, a hole in the uppermost base and a hole in the lowermost base, a bolt passing through said holes and a nut threaded on said bolt adapted to bring the gripping legs together when tightened in use by rocking movement of one of the bases, the improvement comprising: the uppermost base is rocked about its flange; the head of the bolt has a flat portion which lies adjacent to said flange of the lowermost base restraining the bolt from turning as the nut is turned in use; and a biasing leaf spring to urge the gripping legs apart, said leaf spring being "L"-shaped and comprising upper and lower planar leaves extending with respect to each other to provide an obtuse included angle therebetween when not compressed, said lower planar leaf bearing against and lying closely adjacent the inner wall of the gripping leg associated with the uppermost base, said upper planar leaf being sandwiched between the uppermost and lowermost bases, and a hole in said upper planar leaf through which said bolt passes, the angle between the leaves of the spring being such that the spring biases the gripping legs to an open position suitable for insertion of sheet articles between them when the nut is loosened on the bolt.

4,594,755

CABLE BRANCH-OFF SEALING MEMBER

James H. Ball, St. Paul, and Mark D. Sorlien, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 18, 1985, Ser. No. 713,349

Int. Cl.⁴ H02G *15/04*; F16B *4/00*

U.S. Cl. 24—545 **8 Claims**

1. A cable branch-off sealing member for use with a heat

shrinkable sheet material having a hot melt adhesive on one surface and being wrapped around two closely spaced parallel cables with the adhesive surface facing the cables, one end of the sheet material being pinched together between the cables to one side of the cables, generally along a line tangent to the periphery of the cables, to create a loop of heat shrinkable material between the cables, which cable sealing member holds the two layers of sheet material together while the sheet material is heated and shrunk to create a waterproof seal around the cables, comprising:

an elongate tongue smoothly tapered at its leading end for insertion into the loop of heat shrinkable sheet material, said tongue having a width greater than the spacing between the cables to bridge between the peripheries of the cables and being bowed centrally of its width along its length to cause the two layers of heat shrink material to bow outward generally midway between the cables, and

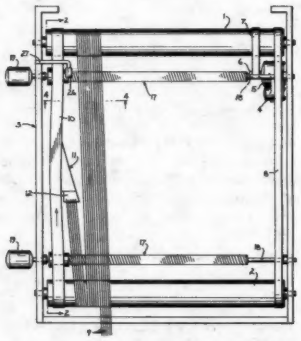
a narrow tail connected to the trailing end of said tongue generally midway of its width and extending perpendicular to the length of said tongue to extend into the space between the cables to maintain the spacing between the cables and to keep said tongue generally between the cables as the heat shrinkable material is heated and shrunk, said tail being formed along an axis parallel to its length with smooth surfaces for contacting the cables.

4,594,756

METHOD AND APPARATUS FOR PRODUCING A SUBSTRATE COMPOSED SOLELY OF LONGITUDINAL YARNS

David A. Beck, Appleton, Wis., assignor to Appleton Mills, Appleton, Wis.

Filed Sep. 20, 1983, Ser. No. 534,183
Int. Cl.[4] D04H *3/00, 5/02*
U.S. Cl. 28—100 **15 Claims**



1. An apparatus for producing a loop-shaped substrate composed solely of helical wound yarns, comprising a pair of support members, an endless winding member mounted on the support members for travel in an endless path, means for preventing movement of said endless winding member longitudinally of said support members, a plurality of yarns, connecting means for connecting the yarns in generally parallel relation to a side portion of said winding member, said yarns being disposed generally parallel to the direction of travel of said winding member, drive means to drive the winding member in said path of endless travel to thereby wind said yarns on said support members in a helical pattern, guide means spaced between said support members and having generally parallel yarn receiving receptacles extending generally parallel to the direction of travel of said endless member, and transfer means acting in synchronization with said winding member for shifting the feed point of the wound yarns along said support members in a direction lateral of the direction of movement of said winding member to thereby enable additional portions of said yarns to be wound on said support members in a subsequent pass.

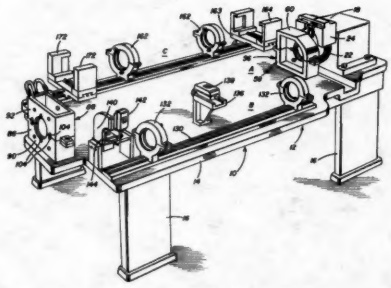
13. A method of forming an endless substrate composed solely of longitudinally extending yarns, comprising the steps of mounting an endless belt around a pair of spaced generally parallel support members, connecting a plurality of yarns to a side edge portion of said belt, driving the belt in endless path to thereby wind the yarns on the support members in a helical pattern, maintaining said belt in a fixed path of endless travel on said support members, positioning said yarns during movement of said belt in lateraly spaced relation in a guide receptacle, and moving the receptacle to shift the feed point of the wound yarns along the support members in a direction lateral to the direction of movement of said belt to thereby enable additional portions of said yarns to be wound on said support members in a subsequent pass.

4,594,757

MACHINE FOR REBUILDING DRIVE SHAFTS

Royce O. Johnson, Jr., P.O. Box 5899, Pine Bluff, Ark. 71611

Filed Jun. 8, 1984, Ser. No. 619,312
Int. Cl.[4] B23P *23/04, 19/02;* **G01B** *5/24*
U.S. Cl. 29—33 K **9 Claims**



1. A drive shaft rebuilding machine including a mount, a support and cutting station including support means on said mount for stationarily supporting therefrom a drive shaft including a center tube section and opposite end torque transmitting end members having shank portions telescoped into and welded to the opposite ends of said tube section by peripheral weld zones, said support and cutting station including cutting means operative to peripherally precisely depth cut-away a selected weld zone and separation means operative to axially separate said tube section from the end member on the side of said zone remote from said tube section, a test station mounted on said support and including axially spaced journaled means on said support for journalling opposite end portions of said center tube section therefrom, said test station additionally including lateral deflection sensing and indicating means intermediate said journal means for sensing and indicating lateral deflection of the longitudial midportion of said center tube section during rotation of said center tube section relative to said journal means and misalignment sensing and indicating means for sensing and indicating misalignment of the end members at opposite ends of said center tube section, a reinstaller station including a pair of axially spaced supports on said mount for slidably supporting a center tube section from its opposite end portions for at least limited guided axial shifting of said center tube section relative to said supports, first and second abutment means on said mount spaced outward from remote sides of said supports, said abutment means including means for supportively engaging remote extremities of said torque transmitting end members in alignment with the center axis of a center tube section supported from said supports, one of said supports being stationarily mounted from

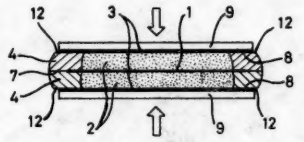
said mount and means supporting the other of said supports from said mount for guided rectilinear shifting toward and away from said one support, and means operative to gradually forcible shift said other support toward said one said support.

4,594,758

METHOD OF PRODUCING AN ELECTRICAL DOUBLE LAYER CAPACITOR

Kohichi Watanabe, and Michihiro Murata, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaoka-kyo, Japan

Filed Jun. 20, 1984, Ser. No. 622,735
Claims priority, application Japan, Jun. 21, 1983, 58-111568
Int. Cl.⁴ H01G *13/00*
U.S. Cl. 29—25.42 **7 Claims**



1. A method of producing an electrical double layer capacitor, said method comprising the steps of:

placing a separator between an opposed pair of elastically deformable insulating members and bonding said separator thereto to form openings on opposite sides of said separator;

filling said openings with material disposed to form polarization electrodes on opposite sides of said separator;

bonding current carrying electrodes comprised of an electrically conductive resin in the semi-hardened state to said insulating member with a bonding agent to form a bonded structure;

cutting the periphery of said bonded structure to the desired shape thereby forming an outer edge at said periphery; and

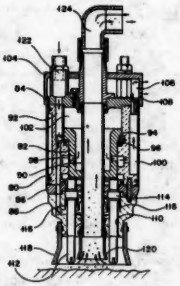
pressing the bonded structure to deform the insulating members and in this state completely hardening said current conductive resin and said bonding agent.

4,594,759

SURFACE-CHISELING MACHINE

Hideaki Ikeda, No. 4-16-17, Kinshi, Sumida-ku, Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,598
Claims priority, application Japan, Apr. 13, 1985, 60-79015
Int. Cl.⁴ B21C *43/00*
U.S. Cl. 29—81 D **5 Claims**



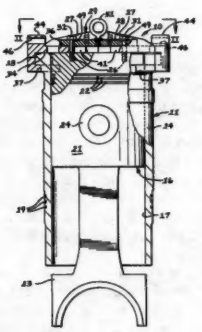
1. A surface-chiseling machine for refractory, concrete of other materials, which comprises a piston having at its one end a step portion and on a side periphery at its other end a through-hole, and a cylinder forming a first air chamber on a closed side of the step portion of said piston, forming an exhausting channel communicated with the through-hole of said piston and having an air hole for feeding a pressure air to said first air chamber, said cylinder at its rear end being closed with a back head for forming therein a second air chamber while at its front end being closed with a front head which is provided with a plurality of chisel-inserting holes, into which holes are inserted chisels with their rear ends being contactable directly with a front face of said piston, each of said chisel at its rear end being provided with a protruded step to form on its one side a third air chamber for normally urging the chisel against the piston, said first and third air chambers being continuously fed with the pressure air for reciprocating said piston in a strike in which the second air chamber formed by said piston is communicated alternately with the exhausting channel or the first air chamber via the through-hole, thereby to strike the chisel.

4,594,760

APPARATUS FOR AND METHOD OF PACKAGING AND INSERTING AN ENGINE CYLINDER ASSEMBLY INTO AN ENGINE BLOCK

Harvey G. Dillard, Princeville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 18, 1985, Ser. No. 713,362
Int. Cl.⁴ B23P *15/00*; B65B *61/00*; B65D *85/68*; B66C *1/00*
U.S. Cl. 29—156.4 WL **7 Claims**



1. An apparatus adapted to package a cylinder liner, a piston, rings and a connecting rod as an engine cylinder assembly for installation into a cylinder bore of an engine block as a unit comprising:

a pair of liner engagement brackets each having a lip adapted to positively grippingly engage a radially outwardly extruding flange at one end of the cylinder liner;

means for releasably connecting the pair of brackets together;

a lifting element;

means for releasably attaching the lifting element to the piston so that a portion of each bracket is sandwiched between the lifting element and the piston; and

a hole in said lifting element, including a bolt extending through the hole in the lifting element and adapted to be threaded into a threaded hole in the piston.

2. A method of packaging a cylinder liner, a piston, rings, and a connecting rod as an engine cylinder assembly comprising the steps of:

assembling the cylinder liner, the piston, rings, and the connecting rod into their operational relationship one with the other to form the assembly;

positioning a pair of liner engagement brackets in positive gripping engagement with the cylinder liner;

releasably connecting the pair of brackets together; and

releasably attaching a lifting element to the piston so that a portion of each bracket is sandwiched between the lifting element and the piston.

4,594,761

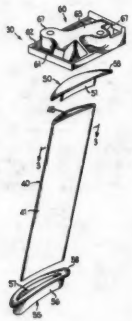
METHOD OF FABRICATING HOLLOW COMPOSITE AIRFOILS

Guy C. Murphy; Jackie D. Jones, both of Fairfield, and Charles T. Salemme, Madeira, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 13, 1984, Ser. No. 579,631

Int. Cl.[4] B23P *15/04*

U.S. Cl. 29—156.8 R **18 Claims**



1. A method of fabricating a hollow airfoil comprising the steps of: providing a core assembly including an elongated support structure of one material and plural elongated mandrels of another material abutting said support structure and cooperating therewith to define the core assembly, then applying a shell around said core assembly encompassing said core assembly except at the ends thereof and contacting said support structure, then bonding said shell only to said support structure, and then removing said mandrels through an open end of said shell leaving a hollow shell with an integral internal support structure.

11. A method of applying a mounting platform to one end of an elongated hollow airfoil, wherein the platform has a recess therein shaped complementary to but dimensioned slightly larger than the one end of the airfoil, comprising the steps of: plugging one end of said hollow airfoil, inserting said plugged end of the airfoil into the recess in the platform with a predetermined substantially uniform clearance space between the recess of said platform and the inserted end of the airfoil, then injecting an elastomeric material into the clearance space for filling same, and then curing the elastomeric material for bonding the inserted end of the airfoil to the platform.

14. A method of fabricating a hollow airfoil assembly comprising the steps of: providing a core assembly including an elongated support structure of one material and plural elongated mandrels of another material abutting said support structure and cooperating therewith to define the core assembly, then applying a shell around said core assembly encompassing said core assembly except at the ends thereof and contacting said support structure, then bonding said shell only to said support structure, then removing said mandrels through one open end of said shell leaving a hollow shell with an integral internal support structure and open ends, plugging one open end of said shell, providing a mounting platform having a recess therein shaped complementary to but dimensioned slightly larger than the plugged end of the shell, inserting the plugged end of the shell into the recess in the platform with a substantially uniform predetermined clearance space between the platform and the inserted end of the shell, then injecting an elastomeric material into the clearance space for filling same, and then curing the elastomeric material for bonding the inserted end of the shell to the platform.

4,594,762

PICKUP HEAD FOR MEASURING AND ASSEMBLING PROCEDURES

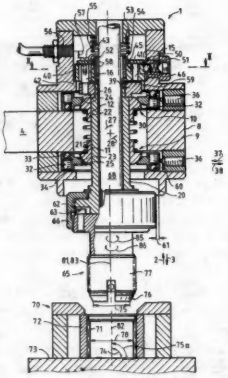
Rudolf Och, Nuremberg, Fed. Rep. of Germany, assignor to Frenco Verzahnungslehren GmbH, Nuremberg, Fed. Rep. of Germany

Filed Feb. 20, 1985, Ser. No. 703,350

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407551

Int. Cl.[4] B23Q *1/00*

U.S. Cl. 29—281.4 **9 Claims**



1. In a pickup head for measuring and assembling processes; including a housing; a drive element; and a central member arranged in the axis of said element and resiliently supported there against; the improvement comprising: cam drive means for pivoting said central member during an axial lift of said housing when said member is axially blocked by an object against the force of springs through an axial angle, said cam drive means including at least one arbor or ball and an inclined groove on said central member and a switch for effecting a feed end return movement at a predetermined axial stroke of the central member.

4,594,763

METHOD AND APPARATUS FOR INSERTING A GLASS ROD INTO A GLASS TUBE

Ralph E. Frazee, Jr., Brick Township, Ocean County; John R. Nis, Hamilton Township, Mercer County, both of N.J.; Joseph Sanchez, Santa Rosa, Calif.; Carroll D. Spainhour, Princeton Township, Mercer County, and Robert P. Stawicki, Brick Township, Ocean County, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 21, 1984, Ser. No. 685,147

Int. Cl.[4] B23Q *17/00*; B23P *21/00*; C03B *23/207*

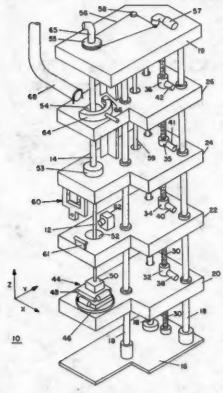
U.S. Cl. 29—407 **16 Claims**

1. A method for inserting a glass rod into a glass tube comprising the steps of:

roughly aligning the rod axially with the tube;

measuring the offset of the rod from the axis of the tube to determine the amount of lateral movement of the rod from the axis of the tube required to achieve precise spaced alignment with the tube;

laterally moving the rod in accordance with the determined amount of movement;



inserting the rod into the tube; and

capturing the rod within the tube following insertion.

4,594,764

PARTS ASSEMBLING METHOD AND SYSTEM

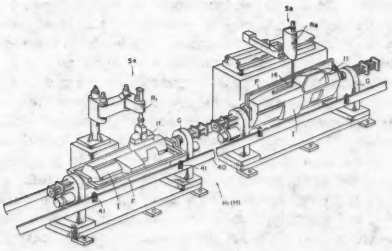
Haruo Yamamoto, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 31, 1984, Ser. No. 646,057

Claims priority, application Japan, Sep. 13, 1983, 58-167409

Int. Cl.[4] B21D *39/00;* **B23Q** *7/00;* **B23P** *19/00*

U.S. Cl. 29—430 **17 Claims**



1. An automatic assembly apparatus for assembling parts or components in a structure member, said apparatus comprising a securing jig means for removably supporting said structure member, a transportation means for transporting said structure member supported by said securing jig means to and from at least one assembly stage, a setting jig means Provided on said at least one assembling stage for positioning said securing jig means with said structure member supported therein, and an automatic device provided on said at least one assembling stage for mounting said parts or components from a predetermined direction to said structure member;

wherein said securing jig means comprises a rectangular frame surrounding said structure member, a plurality of retaining means mounted to said frame for supporting said structure member, and a positioning means for positioning said structure member in said frame.

16. A parts assembly method for automatically assembling parts of components in a structure member, said method comprising the steps of:

securing said structure member on a securing jig,

transporting said securing jig to an assembling stage,

rotating said securing jig to a prescribed angular position,

mounting said parts or components onto said structure member from a prescribed fixed direction,

rotating said securing jig to an original position, and

removing said securing jig from said assembling stage;

wherein said securing jig with said structure member supported therein is rotated through a setting jig provided in said assembly stage.

4,594,765

STRAND COVERING DEVICES AND METHODS

Joseph W. Kinnear, 2765 First Pl., Vero Beach, Fla. 32960

Filed Nov. 16, 1984, Ser. No. 672,137

Int. Cl.[4] B23P *11/02, 19/02*

U.S. Cl. 29—450 **16 Claims**

12. A method for applying a longitudinally slit, flexible, covering tube around a longitudinal portion of a strand which comprises:

providing a first planar member having a face surface with a first longitudinal guide groove therein and a second planar member having a face surface with a second longitudinal guide groove therein that approximately mimics said first groove,

placing said planar members together face-to-face with said first and second grooves longitudinally mated and with said strand portion positioned in said tubular guide path defined by said mated grooves,

guiding said covering tube along a locus that intersects said longitudinal axis of said guide path at an angle,

opening a portion of said slit of said covering tube as it transmits said locus adjacent said point of intersection of said locus with said axis,

turning said covering tube from said locus onto said axis as it passes said point of intersection causing said strand to enter said tube through said opened portion of said tube,

closing said opened portion of said tube and

drawing the resulting tube covered strand portion along said longitudinal axis away from said point of intersection.

15. A device for use in applying a slit, flexible, covering tube around a shroud of a sailboat which comprises:

means defining a tubular guide path for relative movement therein of a portion of said shroud,

means to guide said covering tube along a locus that intersects the longitudinal axis of said guide path at an angle,

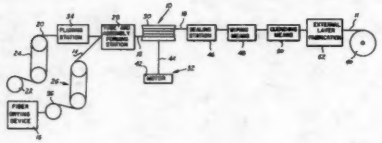
means to open said slit of said covering tube as it transits said locus, and

means to turn said covering tube with its opened slit from said locus onto said longitudinal axis whereby said tube may slip over said shroud in said guide path.

4,594,766
OPTICAL FIBER CABLES HAVING IMPROVED HERMETICITY

Warren F. Smith, Jr., Branford; Eugene Shapiro, Hamden, and Joseph Winter, New Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 25, 1985, Ser. No. 705,246
Int. Cl.[4] B23P *19/04*; G02B *6/44*
U.S. Cl. 29—460 18 Claims

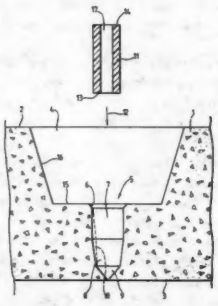


1. A process for fabricating an optical fiber communication cable, said process comprising:
providing at least one optical fiber having a buffer material;
drying each said optical fiber so as to reduce the water content of said buffer material; and
encapsulating said at least one optical fiber in a metal or metal alloy tube.

4,594,767
METHOD OF PRE-MOUNTING AN ANCHORAGE DEVICE

Bengt Persson, Götene, Sweden, assignor to Bertil Persson and Lars-Olof Aberg, both of Grotene, Sweden, part interest to each

Filed Apr. 3, 1984, Ser. No. 596,398
Claims priority, application Sweden, Apr. 18, 1983, 8302139-4
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—525 7 Claims

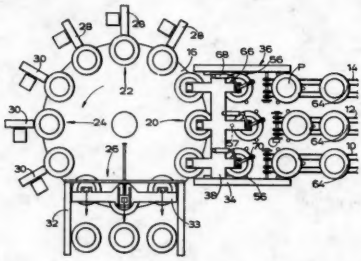


1. A method of manufacturing a concrete object having a guide recess with a bottom surface, a sleeve and an anchorage device pre-mounted in said sleeve, comprising the steps of:
molding concrete in a mold to form said concrete object;
during said molding step, forming a channel located at a central portion of said bottom surface, said channel having an obtusely tapered first channel portion at an end of said channel remote from said bottom surface;
vibrating said concrete object while said concrete object is in said mold;
before said concrete hardens, removing said concrete object from said mold without support for said channel;
hardening said concrete object without support for said channel, so that during said removing and hardening steps said channel deforms;
utilizing said guide recess to align said sleeve with said channel;
inserting said sleeve into said channel until an end of said sleeve abuts said obtusely tapered end of said channel, the other end of said sleeve protruding from said bottom surface; and
pre-mounting said anchorage device in said sleeve.

4,594,768
TRIMMING CERAMIC FLATWARE

Robert Gater, Rode Heath, and Peter A. Pass, Werrington, both of England, assignors to Service (Engineers) Limited, Stoke-on-Trent, England

Filed Jun. 3, 1983, Ser. No. 500,968
Claims priority, application United Kingdom, Jun. 5, 1982, 8216438
Int. Cl.[3] B23P *23/00*
U.S. Cl. 29—564 9 Claims



1. Apparatus for trimming the periphery of an article of ware in the manufacture of ceramic flatware comprising tool-mounting means, article-mounting means, tool-advancing means whereby relative movement can be caused between a rotating rotary trimming tool mounted on the tool-mounting means and an article of ware mounted on the article-mounting means, to cause the tool to trim the article progressively along its periphery, and tool-locating means whereby the tool is so caused to trim the article to a predetermined profile, the apparatus comprising orientating means operative to bring an article to a predetermined orientation for registration with said tool-locating means, said orientating means comprising searching means arranged to detect a predetermined reference feature at the periphery of the article, means arranged to move said searching means to scan the periphery of the article progressively from a datum position until a predetermined disposition relative to the reference feature is assumed, means arranged to return said searching means to its datum position, and means arranged to rotate the article to maintain said relative disposition, whilst said searching means is returned to its datum position, so to bring said reference feature to a position corresponding with said datum position and said article to a predetermined orientation.

4,594,769
METHOD OF FORMING INSULATOR OF SELECTIVELY VARYING THICKNESS ON PATTERNED CONDUCTIVE LAYER

Russell C. Ellwanger, Felton, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

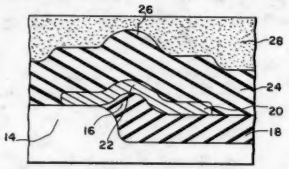
Filed Jun. 15, 1984, Ser. No. 621,001
Int. Cl.[4] H01L *21/465*
U.S. Cl. 29—578 16 Claims

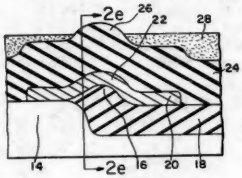
1. A manufacturing method in which: a body is provided with a patterned first electrically conductive layer having a portion protruding upward beyond adjacent parts of the conductive layer; and an electrically insulating layer is formed on the conductive layer and on adjacent parts of the body such that a portion of the insulating layer protrudes upward beyond adjacent parts of the insulating layer generally at the location

above the protruding portion of the conductive layer; characterized by the steps of:

forming on the insulating layer a further layer having a generally planar upper surface;

exposing at least part of the protruding portion of insulating layer by etching the further layer with a first etchant that





attacks material of the further layer much more than material of the insulating layer; and

etching the remainder of the further layer and the insulating layer as it becomes exposed with a second etchant that attacks material of the insulating and further layers at rates not substantially different from each other.

4,594,770

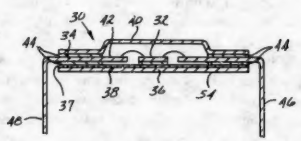
METHOD OF MAKING SEMICONDUCTOR CASING

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 398,497, Jul. 15, 1982, Pat. No. 4,480,262. This application Aug. 9, 1984, Ser. No. 639,168

Int. Cl.[4] H01L *21/52, 21/50, 23/40, 23/10*

U.S. Cl. 29—588 **7 Claims**



1. The method of forming a casing adapted to receive an electrical component, comprising the steps of:

providing a metal base member;

providing a metal leadframe having first and second oppositely disposed surfaces;

disposing the first surface of said metal leadframe adjacent said first surface of said leadframe;

providing a premolded plastic housing member adjacent the second surface of said leadframe, said premolded plastic housing member having an inner surface shaped to form a hollow enclosure, said enclosure adapted to receive said electrical component, said housing member further having a metal foil substantially over the inner surface of said housing member to form a substantially impervious barrier to interdiffusion of contaminants into said enclosure through said housing member; and

adhesively bonding said metal leadframe between said housing member and said base member for sealing said metal leadframe.

4,594,771

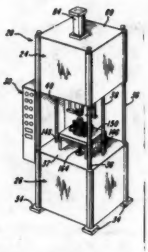
APPARATUS AND METHOD FOR AUTOMATICALLY INSERTING COILS AND WEDGES INTO A STATOR CORE OF ANY GIVEN LENGTH

Robert C. Appenzeller, Washington Township, Montgomery County; Curtis R. Bailey, Dayton, and Ronald L. Gable, Brookville, all of Ohio, assignors to Machine Products Corporation, Dayton, Ohio

Filed Sep. 20, 1984, Ser. No. 652,126

Int. Cl.[4] H02K *15/00*

U.S. Cl. 29—596 **20 Claims**



9. Apparatus for automatic insertion of prewound coils and wedges into a stator core having stator slots and in which the stator core may be any length, comprising:

support structure for support of a stator core,

measurement means movable from a given position and engageable with the stator core for sensing the length of the stator core,

coil insertion means for inserting coils into a stator core,

wedge insertion means for inserting wedges into a stator core,

operator means,

means joining the operator means to the measurement means and to the coil insertion means and to the wedge insertion means for coordinating operation of the measurement means with operation of the coil insertion means and the wedge insertion means,

the operator means operating in accordance with the length of the stator core measured by movement of the measurement means for operation of the coil insertion means and the wedge insertion means for insertion of coils and wedges into the stator slots of the stator core in accordance with the length of the stator core.

4,594,772

METHOD OF MANUFACTURING COMPOSITE MAGNETIC TRANSDUCER

Anton M. Bucher, Glendora, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Dec. 4, 1979, Ser. No. 100,045

Int. Cl.[4] G11B *5/42*

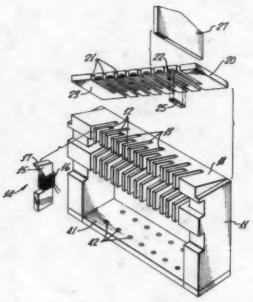
U.S. Cl. 29—603 **3 Claims**

1. In the manufacture of a composite magnetic transducer of the type including a pair of opposed support brackets having opposed magnetic pole pieces therein, the pole pieces in each bracket having edge faces all lying substantially in a common plane which is common with a first surface of each of said support brackets, and a pair of tip plates each having grooves in a first surface thereof for receipt of pole tips, the first surfaces of said tip plates being adapted to be secured to respective first surfaces of said support brackets with said pole tips engaging said edge faces of said pole pieces and with a coupling gap between said pole tips to define signal channels for

cooperation with a magnetic record medium, the method comprising:

hard anodizing said first surfaces of said tip plates prior to assembly thereof with said pole tips or said support brackets, wherein said step of hard anodizing said first surfaces of said tip plates also hard anodizes the inside surfaces of said grooves;

securing said pole tips into said grooves in said tip plates subsequent to said hard anodizing step;



subsequently securing said tip plates to said support brakcets;

subsequently securing said opposed support brackets to each other; and

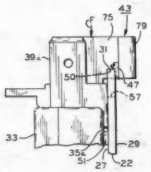
subsequently machining the surfaces of said tip plates opposite to said first surfaces thereof to a depth close to or at said hard anodized areas thereof.

4,594,773

METHOD OF ASSEMBLING A SWITCH AND TERMINAL ASSEMBLY TO AN END FRAME FOR A DYNAMOELECTRIC MACHINE

James P. Frank, Rock Falls, Ill., and James L. King, Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed May 20, 1983, Ser. No. 496,524
Int. Cl.[4] H01H *11/00*
U.S. Cl. 29—622 **29 Claims**



27. A method of assembling a switch and terminal assembly with an end frame for a dynamoelectric machine, the switch and terminal including a casing, at least one means on the casing and extending therefrom for mounting in engagement with the end frame, and at least one deformable section on the at least one mounting means, and the end frame including a pair of generally opposite faces, at least one slot means interposed between the opposite faces for receiving the at least one mounting means, the method comprising the steps of:

placing a part of the casing in engagement with one of the opposite faces of the end frame and extending the at least one mounting means through the at least one slot means;

applying a force on at least one of the switch and terminal assembly and the end frame and moving thereby the switch and terminal assembly toward an assembly position on the end frame; and

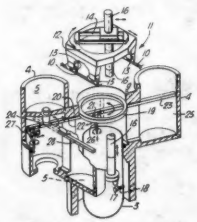
engaging the at least one deformable section on the at least one mounting means with the at least one slot means in the end frame at least adjacent the other of the opposite faces thereof and shearing thereby a part of the at least one deformable section therefrom in response to the applying and moving step.

4,594,774

MACHINES FOR DISMANTLING DECOMMISSIONED NUCLEAR REACTORS

Allan Barker, Chester, England, and Nigel W. Collins, Caldicot, Wales, assignors to United Kingdom Atomic Energy Authority, London, England

Filed May 7, 1984, Ser. No. 607,820
Claims priority, application United Kingdom, Mar. 27, 1984, 8407901
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—723 **9 Claims**



1. A machine for dismantling, unloading and transferring to a disposal facility, nuclear reactor structure, including components which have been irradiated during operation of the reactor, the machine comprising:

a. a vertically extending mast of adjustable longitudinal extent;

b. means supporting the mast from a rigid, undismantled part of the reactor whereby the mast extends into a pressure vessel of the reactor located beneath said supporting means;

c. means for moving the mast transversely of its longitudinal axis whereby the mast can be moved into different positions within the interior of said pressure vessel;

d. a manipulator mounted on the mast for movement relative thereto and for supporting and operating a variety of tools for effecting dismantling of said structure;

e. a movable beam mounted beneath said supporting means and above the pressure vessel, said beam extending transversely of the mast and being movable angularly in a horizontal plane over an area encompassing the range of said transverse movement of the mast;

f. hoist means mounted for traverse along said beam and extendable into said pressure vessel for lifting parts of the pressure vessel after such parts have been prepared for dismantling by said tool-supporting manipulator; and

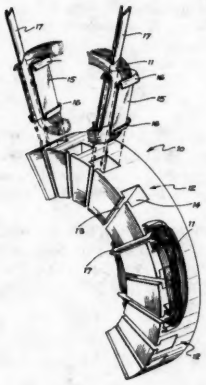
g. at least one fixed beam mounted in the same horizontal plane as said movable beam for registration with the movable beam when the latter is in a predetermined angular orientation, said fixed beam when so registered forming a continuation of the movable beam whereby the hoist can be transferred from the movable beam on to the fixed beam and traversed to an unloading station.

4,594,775

WINDING AND INSULATION INSERT DEVICE

Louis Stanley, Peakhurst Heights, Australia, assignor to Card-O-Matic Pty. Limited, New South Wales, Australia

Filed Mar. 7, 1984, Ser. No. 587,306
Claims priority, application Australia, Mar. 31, 1983, PF8708
Int. Cl.[4] H02K *15/06*
U.S. Cl. 29—736 26 Claims



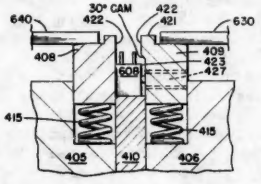
1. An apparatus to form and install field windings in a core of an axial flux induction electric machine, said core having a radial face with a plurality of radially extending slots which receive field windings, said apparatus comprising: a core support to receive said core and support same with said face exposed; a field winding former having a peripheral surface about which wire is wound to form said field windings, said former having a terminal end from which said field windings are delivered into said slots; a winding assembly to move said wire about an axis in a spiral manner so as to form convolutions of said wire on said former thereby forming said field windings; said peripheral surface having a configuration complementary to the configuration of said slots so that the convolutions on said former have a configuration enabling location of the convolutions in said slots so as to extend therealong to form field windings on the core; and press means moveable along said peripheral surface in a direction generally parallel to said axis to move said convolutions from said former into said slots.

4,594,776

CONNECTOR INSTALLATION STATION FOR COMPACT SEMI-AUTOMATIC CABLE ASSEMBLY SYSTEM

James D. Anderson, Norwalk, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Feb. 19, 1985, Ser. No. 702,992
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—749 5 Claims



1. In apparatus for installing connectors, each having a body portion and a cover portion, onto flat cables having multiple electrical conductors separated by, and encased in, electrically insulating material, said apparatus comprising a frame, magazines on said frame operatively positioned to support a plurality of body portions and cover portions respectively, and a transport station to sequentially move portions of connectors from said magazines to an installation station, an improved installation station comprising:

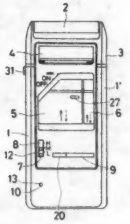
platen means for supporting a cable in a generally horizontal plane, said platen means including two platens vertically reciprocable independently of each other and laterally offset from each other with a space therebetween to allow the passage of a connector portion therepast, an anvil fixedly positioned between said two platens and in a horizontal plane beneath said first mentioned plane a distance sufficient to allow a connector portion on said anvil to be located entirely beneath said first mentioned plane, and nest guides having generally vertical faces operatively positioned with respect to said anvil for guiding and positioning of the connector portions into the installation station and for aligning the cable with the connector portions to which it is to be assembled as the cable is supported by at least one platen.

4,594,777

ELECTRIC SHAVER WITH A DRIVE REGULATOR

Yutaka Kimoto, Sumoto; Toru Morioka, Hyogo, and Yasuo Mitani, Sumoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Sep. 8, 1983, Ser. No. 530,210
Claims priority, application Japan, Sep. 16, 1982, 57-1618895; Jan. 27, 1983, 58-12195; Jan. 27, 1983, 58-12196
Int. Cl.[4] B26B *19/02*
U.S. Cl. 30—42 9 Claims



1. An electric shaver, which comprises:

a housing;

a fixed cutter mounted to the housing;

a movable cutter arranged to slide along the fixed cutter;

a driving motor linked to the movable cutter for slidably moving the movable cutter along the fixed cutter;

a power supply circuit electrically connected to the driving motor for supplying a selectively controllable voltage to the driving motor, the power supply circuit comprising a charging circuit and a control circuit, the charging circuit including a voltage reducing transformer, and a rectifying element and a rechargeable battery connected in series with the secondary coil of the voltage reducing transformer, the control circuit being connected to the driving motor in parallel to the rechargeable battery, the control circuit including a starting switch and at least one voltage drop element having a substantially constant voltage characteristic, the starting switch and the at least one voltage drop element being connected in series with the driving motor, the control circuit further including means for selectively providing a short circuit across the at least one voltage drop element, the short circuit providing means being connected in parallel to the at least one voltage drop element and including a operator controllable switch

mounted to the housing for selectively shorting the at least one voltage drop element, the starting switch being mounted to the housing.

4,594,778

SHAVING UNIT

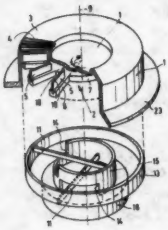
Marinus J. J. Dona, Eindhoven; Adrianus J. J. Franken, Maarheeze; Freddy Haes, and Cornelis M. Reynhout, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1985, Ser. No. 713,521

Claims priority, application Netherlands, Mar. 21, 1984, 8400887

Int. Cl.[4] B26B *19/04*

U.S. Cl. 30—43.9 5 Claims



1. A shaving unit for a dry-shaving apparatus, the shaving unit comprising an external first cutting member having an annular wall portion with hair-entry apertures, and an internal second cutting member which is cooperable with the first cutting member and which comprises a ring of cutters, which second cutting member can be driven relative to the first cutting member so as to perform an oscillatory rotational movement, characterized in that the first and second cutting members are interconnected by at least two resilient elements, each of which has an end connected to the first cutting member and an end connected to the second cutting member and which are so arranged that their elastic properties will permit the oscillatory rotational movement of the second cutting member, but which are rigid in directions extending substantially parallel to and radially of the rotational axis of the second cutting member.

4,594,779

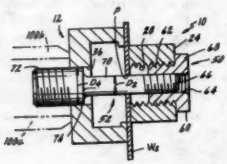
PUNCH AND DIE ADAPTER

Kenneth L. Hagemeyer, Rockford, Ill., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 1, 1984, Ser. No. 667,253

Int. Cl.[4] B26F *1/32*

U.S. Cl. 30—360 3 Claims



1. In combination a draw stud and adapter member for use in punching a hole in material having a small pilot hole therein with a punch and die wherein the punch includes a threaded longitudinal bore of selected diameter adapted to receive a large diameter draw stud unable to pass through the small pilot hole and the die includes a coaxial longitudinal bore adapted to receive the large diameter draw stud, said adapter member having a threaded male portion with a diameter substantially the same as the selected diameter of the threaded longitudinal bore of the punch for threadable engagement in said threaded longitudinal bore and a threaded female portion having a smaller diameter than said selected diameter of said threaded longitudinal bore and said draw stud having a threaded end portion with substantially said smaller diameter adapted for passing through the small pilot hole and for threadable engagement in said threaded female portion and another end portion receivable in said longitudinal bore of said die, said adapter member and draw stud being removable by unthreading from the punch to enable a draw stud of the large diameter to be used with the same punch and die.

4,594,780

BRAKE ARRANGEMENT FOR A CHAIN SAW

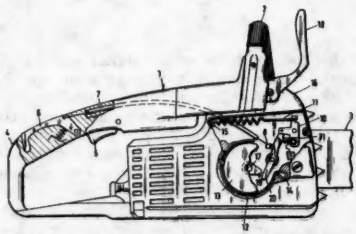
Harald Schliemann, Waiblingen; Michael Wissmann, Markgröningen, and Hans Nickel, Cottenweiler, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,655

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324628; May 23, 1984, 3419152

Int. Cl.[4] B27B *17/00*; F16D *49/04*

U.S. Cl. 30—382 24 Claims



1. A brake arrangement for a chain saw having a housing and a guide bar mounted on the housing for accommodating a saw chain thereon, the chain saw also having a drive motor mounted in the housing, the brake arrangement comprising:

a brake drum operatively connected to the saw chain;

a brake band disposed in surrounding relationship to said brake drum;

a brake member connected to said brake band and being pivotally mounted on the housing for movement between a ready position whereat said brake band is disposed in spaced relationship to said brake drum and a released position whereat said brake band is drawn tightly around said brake drum;

a brake spring connected to said brake member for resiliently biasing said brake member in a direction to cause said brake member to pull said brake band tightly about said brake drum when said brake member is in said released position;

latching means for holding said brake member in said ready position against the force of said brake spring; said latching means including a tensioning member pivotally mounted on said housing;

cam means connected to the drive motor for rotational movement through a predetermined path; and,

release means operatively connected to said latching means for opening the same to permit rotational movement of said brake member to said released position in response to a first actuation of said release means and for releasing said tensioning member in response to a second actuation of said release means for movement of said tensioning member into said path after said brake member is in said released position in which path said tensioning member

follows said cam means in a movement that causes said tensioning member to again coact with said latching means to return said brake member to said ready position and to reclose said latching means whereby the latter again holds said brake member in said ready position against the force of said brake spring.

4,594,781

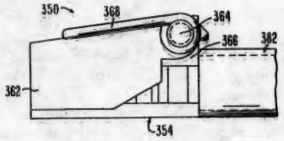
HOLDER FOR SABER SAW BLADE

Simon J. Hoffman, P.O. Box 75821, Los Angeles, Calif. 90075

Division of Ser. No. 485,767, Apr. 18, 1983, Pat. No. 4,470,196. This application Jul. 6, 1984, Ser. No. 628,676

Int. Cl.[4] B27B *19/00*

U.S. Cl. 30—392 1 Claim



1. A holder for a saber saw comprising: a support including an elongated extension having a pair of opposed side recesses; and means shiftably mounted on the support for releasably holding the saber saw blade in the recess, the holding means including spring structure biasing the holding means into a blade holding position, said holding means including an inverted U-shaped element pivotally mounted on the support and biased into an operative position closing the sides of the recesses to form a pair of generally parallel slots, one of the slots having a width greater than the other slot, the extension having a hole therein for receiving a lateral extension on a blade to permit the blade to be securely held to the extension when the rotatable element is in a closed condition.

4,594,782

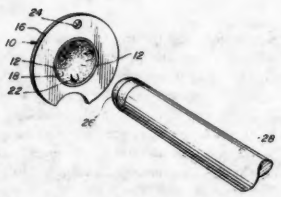
BILLIARD CUE TIP SHAPER, SCUFFER, TRIMMER AND GAUGE

James A. Willard, 2213 Jericho Rd., Aurora, Ill. 60506

Filed Aug. 9, 1985, Ser. No. 764,213

Int. Cl.[4] B27L *9/00*

U.S. Cl. 30—494 4 Claims



1. A cue tip shaper, scuffer and trimmer comprising:

a metal member having a generally concave depression therein;

an abrading material covering the bottom of the depression; and

a plurality of spaced tabs or lugs extending outwardly from the depression and arranged in a single, generally circular array, each of said tabs or lugs being covered by said abrading material at least on their inwardly facing surfaces;

whereby the face of a cue stick when rotated in said depression is shaped and scuffed and any portion thereof extending beyond the circumference thereof is trimmed by said tabs or lugs.

4,594,783

PROCESS FOR THE STANDARDIZATION OF PRIMARY MODELS USED IN THE FABRICATION OF SHOES

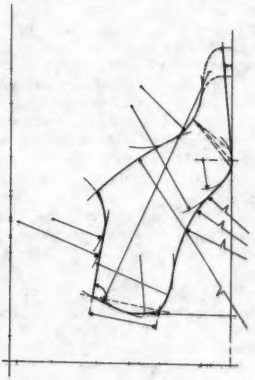
Francisco M. Chaumel, Elda-Alicante, Spain, assignor to Procedimientos Industriales Technologicos para la Fabricacion de Maquinaria y Afines del Calzado, S.A. (PIT MAC, S.A.), Spain

Filed Feb. 14, 1984, Ser. No. 580,141

Claims priority, application Spain, Feb. 17, 1983, 519,867

Int. Cl.[4] A43D *1/00*

U.S. Cl. 33—6 11 Claims



1. A process for making original primary models for the fabrication of shoes, the process comprising the steps of:

a. forming a longitudinal profile of a last relative to a theoretical ground line, the ground line length of said last corresponding to the actual length of said profile;

b. dividing said profile into three equal parts, forming two posterior thirds and one anterior third;

c. establishing a basic longitudinal support for the part of the foot in the two posterior thirds, said support especially affecting the tarsus and metatarsus zone;

d. establishing a basic support for the plantar or flexion part of the foot in the front third;

e. forming and assembling templates corresponding to the supports established in steps c and d; and

f. filling voids between said templates to form said assembly into a solid basic primary model.

4,594,784

APPARATUS FOR DRAWING AN ELLIPSE USING A PIECE OF STRING

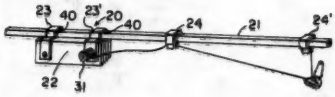
Mikio Ito, NO. 204-362, Jō, Sakura-shi, Chiba-ken, 285, Japan

Filed Jun. 20, 1984, Ser. No. 622,555

Claims priority, application Japan, Jun. 20, 1983, 58-109190; Jun. 20, 1983, 58-109386

Int. Cl.[4] B43L *11/04*

U.S. Cl. 33—30.5 2 Claims



1. An apparatus for drawing an ellipse on a planar surface using

a piece of string, comprising:

a string holder, including:

an arm;

a support having at least one opening into which a portion of said arm near one end of such arm may be inserted so that such arm is supported so as to extend over and parallel to said surface on which an ellipse is to be drawn; and

two sliders slidably mounted on said arm; each of said sliders having:

means for fixing such slider in a selected position on such arm; and

means for securing said string at a respective site on such string to the respective slider, so that the string, between such sites, is disposed to pass under said arm; and

a string-guided drawing device, including:

a shaft which is adapted to be disposed generally upright in relation to said surface so as to have a relatively lower end nearer such surface and a relatively upper end further from said surface and arranged to be grasped for moving said drawing device;

an arm secured to said shaft so as to extend radially from said shaft in the vicinity of said lower end of said shaft, this arm being rotatable about the longitudinal axis of said shaft;

means defining a perforation through said arm of said device, this perforation extending generally parallel to the longitudinal axis of said shaft so as to have a relatively lower end opening nearer said surface and a relatively upper end opening further from said surface, this perforation being disposed at a site which is laterally displaced from where said arm of said device is secured to said shaft;

a drawing means adapted when moved across said surface with a tip thereof in engagement with said surface to draw a line on said surface; and

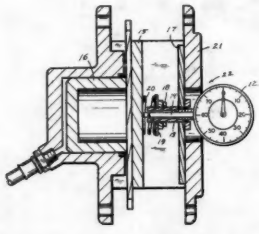
securement means securing said drawing means to said arm of said device so that said tip of said drawing means is disposed relatively below said lower end opening of said perforation and aligned therewith along an axis that extends generally parallel to said longitudinal axis of said shaft, so that with a string slackly extending between and secured to said sliders of said string holder and said sliders fixed to said arm of said string holder, and with said string passing down through said perforation and thus slidably linking said drawing device with said string, said shaft may be moved with said tip of said drawing means in engagement with said surface in a sense to maintain the string taut while moving said tip about said surface, thus drawing an ellipse.

4,594,785

DISC BRAKE CALIPER PISTON DIAGNOSTIC GAUGE

Herman L. Carlson, 4242 Ridgemoor Dr., Traverse City, Mich. 49684

Filed Mar. 20, 1985, Ser. No. 713,813
Int. Cl.[4] G01B 3/22
U.S. Cl. 33—172 R **4 Claims**



1. In a disc brake caliper piston diagnostic gauge for the in situ testing of caliper piston operation, the combination comprising:

a dial gauge having an outwardly extending externally threaded contact indicator probe stem housing member, said stem housing member adapted to extend from said dial gauge into axially aligned close proximity to a caliper piston and brake pad assembly when said disc brake caliper piston diagnostic gauge is in its in situ operative use position on a caliper housing;

an elongate outboard caliper housing anchor plate threadably mounted upon said stem housing member, said outboard caliper housing anchor plate adapted for selective adjustable abutting engagement with the inside surface of an outboard caliper housing when the disc brake caliper piston diagnostic gauge is in its in situ operative use position upon a caliper housing;

a bias spring assembly provided in selective adjustable threadable engagement with said stem housing member said bias spring assembly adapted for selective operative engagement with a caliper piston and brake pad positioned proximate thereto; and

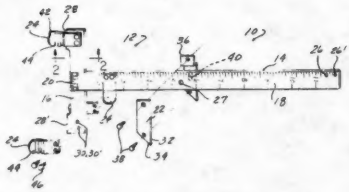
a contact indicator probe extending from said dial gauge through said probe stem housing member, said indicator probe adapted to selectively be in operative engagement with the caliper piston and associated brake pad so as to measure and monitor relative movement of said caliper piston within the caliper housing and to translate the relative movement of the caliper piston into a visual indication on the dial gauge.

4,594,786

BOW SQUARE

Leonard D. Rezmer, Kawkaw, Mich., assignor to The Game Tracker, Inc., Flushing, Mich.

Filed Nov. 29, 1984, Ser. No. 676,487
Int. Cl.[4] G01B 3/30
U.S. Cl. 33—180 R **6 Claims**



1. A bow square for determining the bracing height of a bow string and for facilitating the proper positioning of a nocking point, kisser button and peepsight, which comprises:

(a) a T-shaped flat planar member having a first leg and a second leg, the legs being normal to each other;

(b) a plurality of calibration lines disposed along each leg;

(c) a gauge mounted on one leg and being slidably positionable therealong, the cause being retained in place by frictional engagement with said leg; and

(d) means for detachably engaging a bow string mounted onto each leg having a plurality of spaced openings, each providing a different bow string setting.

4,594,787

IMPROVED BICYCLE FORK END ADJUSTER

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

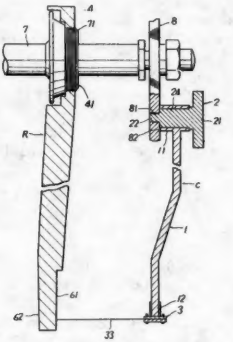
Filed Oct. 7, 1985, Ser. No. 784,893
Claims priority, application Japan, Oct. 17, 1984, 59-157583
Int. Cl.[4] G01B 5/14
U.S. Cl. 33—180 AT **4 Claims**

1. An adjuster for a bicycle frame fork end, said fork end having a support groove for supporting a rear hub and a

threaded bore for mounting a derailleur, said fork end being fixed to a pair of back forks and a pair of chain stays of the bicycle frame, said adjuster comprising:

(a) an operating member comprising a screw member screwable with said threaded bore of said fork end and an elongate operating lever including at one end a support cylinder rotatably supported to said screw member and at another end a measuring portion;

(b) a reference member having on one end a mounting portion with a threaded bore screwable with a threaded portion of an installed member installed on said bicycle



frame, said reference member extending from said mounting portion substantially perpendicular to an axis of said threaded bore of said mounting portion and having on its other end a reference surface disposed opposite to said measuring portion of said operating member substantially parallel to a longitudinal center line of said bicycle frame when said mounting portion is screwed with said threaded portion of said installed member; and

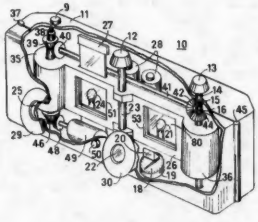
(c) a measuring instrument for measuring a distance between said measuring portion of said operating member and said reference surface.

4,594,788

LIGHT-TIGHT COMBINATION MICROGRAPHIC MAP-READER PROTRACTOR COMPASS

Reuven A. Abergel, 56 Gardner St., Apt. 16A, Allston, Mass. 02134

Filed May 31, 1985, Ser. No. 740,037
Int. Cl.[4] G03B *21/00*; G02B *27/02*
U.S. Cl. 33—275 R **19 Claims**



1. A navigational aid combining a self-illuminated stereo micro-photographic map reader, a direction finder compass and a distance measuring protractor in one self-contained light-tight portable compartment, wherein the navigational aid comprises:

a completely opaque casing with spaced viewing openings for two eyes of a user, wherein each viewing opening seals tight around each eye of the user while viewing emitting no light outside of the eyes of the viewer so that total light control is maintained;

aligned with each viewing opening, a microphotographic reproduction of a landform, wherein each reproduction is taken from a perspective separated from the other reproduction by an average distance between two pupils of the eyes of a human;

a self-powered internal source of light for illuminating the micro-photographic reproduction within the casing for viewing the reproduction and a means for activating and deactivating the light;

a lens means for equally magnifying both reproductions when seen through the eyes of the user;

at least one compass means of establishing direction viewable through at least one of the viewing openings simultaneously with viewing the reproduction;

at least one protractor means of measuring the reproduction in relative scale, which protractor means is viewable through at least one of the viewing openings simultaneously with the reproduction, wherein the protractor appears to overlay the reproduction;

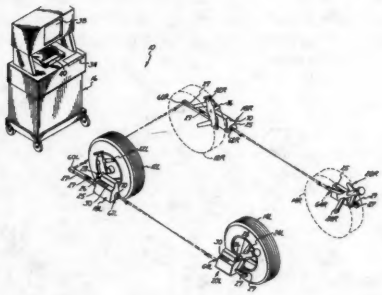
a translucent panel behind the reproduction, which panel is normally closed to outside light by a shutter, which shutter may be opened to admit external light into the casing to illuminate the reproductions for viewing.

4,594,789

WHEEL ALIGNMENT SYSTEM

Joseph A. Marino; Peter A. Puetz, both of Waukesha; Michael J. Kling, Mequon; Curtis A. Finn, Racine; John C. Pendell, West Allis, and Michael C. Crawford, Milwaukee, all of Wis., assignors to Bear Automotive Service Equipment Company, Milwaukee, Wis.

Filed Apr. 22, 1985, Ser. No. 725,759
Int. Cl.[4] G01B *11/275*
U.S. Cl. 33—288 **20 Claims**



17. A system for measuring an angular relationship of a wheel of a vehicle, the apparatus comprising:

a head unit;

positioning means for positioning the head unit in a predetermined relationship to a vehicle wheel;

a target for providing a target image;

means for mounting the target in a predetermined relationship to another wheel of the vehicle;

image sensor means carried by the head unit for producing pixel signals representative of picture elements of a two-dimensional field of view of the image sensor means, the image sensor means being carried by the head unit and positioned so that a position of the target image of the target within the field of view of the image sensor means is dependent upon angular position of the wheel to which the head unit is mounted; and

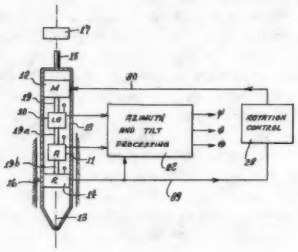
means for deriving an angular relationship of the wheel based upon the pixel signals.

4,594,790

BOREHOLE SURVEYING EMPLOYING RING LASER GYROSCOPE

Harold J. Engebretson, Yorba Linda, Calif., assignor to Applied Technologies Associates, San Marino, Calif.

Filed Sep. 20, 1982, Ser. No. 419,702
Int. Cl.[4] G01C *19/64;* H01S *3/083*
U.S. Cl. 33—304 1 Claim



1. In borehole mapping apparatus, the combination comprising

(a) a first ring laser gyroscope sized for travel in a direction lengthwise of and within the hole, the laser gyroscope characterized by two laser beams traveling along looping paths in opposite directions, and

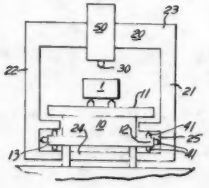
(b) means mounting said gyroscope for travel in the hole and for rotation about an axis extending generally in said direction, each looping path having long and short stretches, the long stretches extending generally in the direction of the borehole, each short stretch extending generally transversely of the borehole, the ratio of the length of a long stretch to the length of a short stretch being substantially greater than 2.

4,594,791

BRIDGE TYPE COORDINATE MEASURING MACHINE

Robert W. Brandstetter, Fairborn, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jan. 24, 1985, Ser. No. 694,378
Int. Cl.[4] G01B *5/03, 7/03*
U.S. Cl. 33—503 22 Claims



1. A bridge type coordinate measuring machine of the type having a base (10) having an upper surface (11) for supporting a work piece to be measured, a bridge (20) having two uprights (21, 22) and a first member (23) connecting the uprights (21, 22) together above the upper surface (11) of said base (10), means (12, 13, 41) for moveably mounting the bridge (20) to the base (10), a probe (30), and means (50, 31) for mounting said probe (30) to the first member (23) of said bridge (20) for movement relative to said bridge and to said base (10), characterized in that:

the bridge (20) has a closed loop configuration that encircles the upper surface (11) of said base (10) said closed loop configuration formed by a second member (24) connecting together the uprights (21, 22) of the bridge (20) below the upper surface (11) of said base (10) and below the means (12, 13) for moveably mounting the bridge (20) to the base (10).

5. A bridge type coordinate measuring machine of the type having a base (10) having an upper surface (11) for supporting a work piece to be measured, a bridge (20) having a closed loop configuration that encircles the upper surface (11) of said base (10) said closed loop configuration formed by two uprights (21, 22), a first member (23) connecting the uprights (21, 22) together above the upper surface (11) of said base (10), and a second member (24) connecting together the uprights (21, 22) of the bridge (20) below the upper surface (11) of said base (10), means (12, 13, 41) for moveably mounting the bridge (20) to the base (10), a probe (30), and means (50, 31) for mounting said probe (30) to the first member (23) of said bridge (20) for movement relative to said bridge and to said base (10), the means for moveably mounting the bridge (20) to the base (10) characterized by:

a pair of guideways (12, 13), located below the upper surface (11) of the base (10), one of said guideways (12) located on one side of said base (10) and the other of said guideways (13) located on the opposite side of said base (10), each of said guideways (12, 13) coacting with respective bearings (41) located in a respective channel (25) formed between said second member (24), and an inwardly extending portion of each of said uprights (21, 22).

19. A bridge type coordinate measuring machine of the type having a base (10) having an upper surface (11) for supporting a work piece to be measured, a bridge (20) having a closed loop configuration that encircles the upper surface (11) of said base (10) said closed loop configuration formed by two uprights (21, 22), a first member (23) connecting the uprights (21, 22) together above the upper surface (11) of said base (10), and a second member (24) connecting together the uprights (21, 22) of the bridge (20) below the upper surface (11) of said base (10), means (12, 13, 41) for moveably mounting the bridge (20) to the base (10), a probe (30), and means (50, 31) for mounting said probe (30) to the first member (23) of said bridge (20) for movement relative to said bridge and to said base (10), the means for moveably mounting the bridge (20) to the base (10) characterized by:

a pair of guideways (12, 13), each of said guideways (12, 13) coacting with a respective plurality of bearings (41), said guideways and bearings located directly below the upper surface (11) of the base (10), one of said guideways (12) and its respective bearings (41) located at one side of said base (10) and the other of said guideways (13) and its respective bearings (41) located at the opposite side of said base (10).

4,594,792

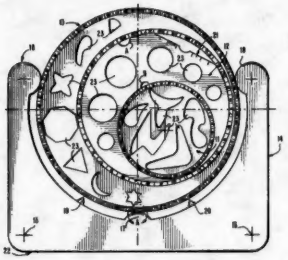
DRAWING APPARATUS

James C. Cramb, 8 Long Street, Frankston Victoria, Australia 3199

Filed Oct. 5, 1984, Ser. No. 657,819
Claims priority, application Australia, Oct. 5, 1983, PG1705/83
Int. Cl.[4] B43L *13/00*
U.S. Cl. 33—562 6 Claims

1. Drawing apparatus comprising at least three discs of increasing diameter, each of said disc being located eccentrically within the disc next in diametrical size and mounted for rotation therein, the diameter of each disc being greater than the radius of the disc next in diametrical size, said discs being mounted for rotation over a sheet of material relative to a reference frame, and at least the smallest disc having at least one cut-out therein, whereby rotation of the disc enables the

cut-out to be infinitely repositioned both angularly and radially within the limits of the apparatus, at least part of the profile of



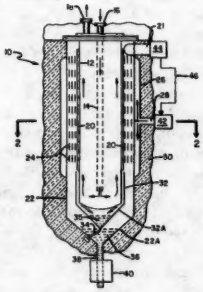
the cut-out being used as a guide about which a marking instrument may be traced to thereby form a pattern on the sheet of material.

4,594,793

DRYING OF PULVERIZED MATERIAL WITH HEATED CONDENSIBLE VAPOR

Larry W. Carlson, Oswego, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 16, 1984, Ser. No. 641,222
Int. Cl.[4] F26B *3/10*
U.S. Cl. 34—10 20 Claims



1. A method of drying moist particles comprising the steps of:

causing a stream of the moist particles to flow in a shallow spiral downwardly about a vertical axis within a drying zone;

injecting a high enthalpy condensible vapor into the stream of particles at a plurality of points at an outer periphery of the spiral to form an atmosphere of heated vapor and remove moisture from the moist particles;

providing a plurality of cooled entrapment surfaces within the spiral, said cooled entrapment surfaces aligned in a direction opposing the spiral flow of said particles for entrapping said vapor and moisture removed from the particles and forming condensate therefrom;

removing said condensate from said entrapment surfaces; and

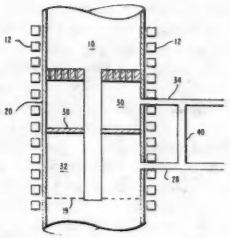
removing the particles having a reduced moisture content from the drying zone.

4,594,794

DEVICE FOR SOLIDS AND FLUID HANDLING AND DISTRIBUTION IN A MAGNETICALLY STABILIZED FLUIDIZED BED

Wei-Kuo Lee, Bridgewater, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 9, 1984, Ser. No. 669,899
Int. Cl.[4] F26B *17/10*
U.S. Cl. 34—57 A 33 Claims



1. A device suitable for handling solids and fluids in conjunction with a fluidizing zone comprising in combination:

stabilizing means disposed about at least a portion of a fluidizing zone for magnetically stabilizing solids contained in that zone;

distributing means located below said fluidizing zone adapted to distribute a fluidizing fluid into the fluidizing zone;

at least one standpipe means extending downwardly from at or near above the upper surface of the distributing means through a generally solids-free zone located below the distributing means, the standpipe means being adapted to allow passage of solids through the solids-free zone while preventing substantial contact between solids therein and the solids-free zone;

separating means situated below the distributing means adapted to form, in combination with the distributing means and the standpipe means, at least one solids-free zone below the distributing means; and

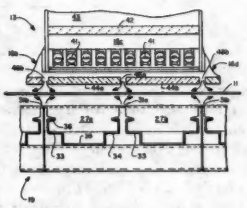
at least one fluid flow means in communication with said at least one solids-free zone.

4,594,795

AIR BEARING SUPPORT APPARATUS FOR DRYING A MOVING WEB

Erik Stephansen, 1504 Black Mountain Rd., Hillsborough, Calif. 94010

Filed Oct. 23, 1984, Ser. No. 663,879
Int. Cl.[4] F26B *13/20*
U.S. Cl. 34—68 5 Claims



1. Air bearing support apparatus for drying a moving web comprising:

first elongated structural member having a length at least as great as said web in a transverse cross-direction and carry-

ing a plurality of side-by-side heater modules for drying said web, and including an air plenum connected to all of said heater modules;

forced air means for supplying air to said air plenum;

each dryer module including a plurality of heater elements in close proximity to said web and including a solid barrier carried by said dryer module between said heater elements and said web, substantially transparent to the heat producing radiation of said heater elements, and including at least one narrow slit in said barrier parallel to the line of movement of said web for allowing the passage of air from said air plenum to the space between said web and barrier;

a second elongated structural member having solid barrier means which are juxtaposed with said solid barriers of said first elongated member to provide a gap there between in which said web may be inserted, said solid barrier of said second member including narrow slits parallel to said line of movement of said web and said solid barrier of said second member is reflective to said heat producing radiation whereby any radiation passing through said moving web will be reflected back;

said second member including an air plenum connected to all of said slits of said solid barrier of said second member for allowing the passage of air from said air plenum to the space between said web and said barrier of said second member, whereby an air bearing is provided for said moving web when inserted in said gap; and

forced air means for supplying air to said air plenum of said second member.

4,594,796

LINT FILTERING DEVICE OF A CONVECTION DRYING AND/OR FIXING MACHINE

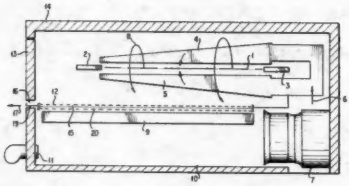
Franz-Josef Gierse, Siegen; Heinrich Hermanns, Korschenbroich; Werner Hermes, Tönisvorst; Gerhard Lüpnitz, Monchen-Gladbach; Manfred Pabst, Cologne, and Heribert Schlicht, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to A. Manforts GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,689

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336333

Int. Cl.[4] F26B *13/02*

U.S. Cl. 34—82 **6 Claims**



1. In a convection drying and/or fixing machine having an interior chamber, the improvement comprising a lint filtering device disposed in the chamber for treating a textile fabric web, including a component for drying and/or fixing the fabric web, for circulating air in a heated air stream flowing from the fabric web to said component, a filter screen having a given hole size for protecting said component from lint and other deposits, said filter screen being disposed substantially horizontally in an operating position in said air stream from which said filter screen can be horizontally removed and cleaned, a protective screen having a substantially said given hole size, and means for holding said protective screen substantially horizontally in place below said filter screen and above said component to be protected during normal operation of the machine.

4,594,797

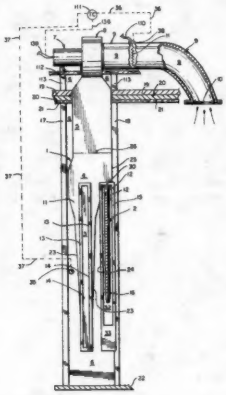
AIR TOWEL

Jasper C. Houck, Jr., 6513 S. Donna La., Oklahoma City, Okla. 73150

Filed Oct. 31, 1984, Ser. No. 666,674

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—225 **7 Claims**



1. A device for providing heated air for drying comprising:

a means for supplying air to an inner enclosure;

a means for heating air including an electrically operated component;

air drawn into said means for supplying the air being heated by said means for heating air;

said inner enclosure having a top edge in communication with said means for supplying air; said inner enclosure having a front wall, a rear wall, and side walls;

an elongated slot being provided in said front wall;

said elongated slot being generally vertical;

said side walls of said inner enclosure member tapering generally smoothly from a region intermediate a top edge and a bottom edge of said slot;

said inner enclosure being composed of electrically insulating material; said inner enclosure being adapted for mounting within an outer enclosure having an outer wall such that said front wall of said inner enclosure is adjacent said outer wall;

said outer wall having a first elongated opening therein communicating with said elongated slot; said outer wall having an interior surface and an exposed surface; said front wall of said inner enclosure being mounted adjacent said interior surface;

said front wall of said inner enclosure having an upstanding flange fixed thereto bordering said elongated slot; said upstanding flange penetrating said first elongated opening in said outer wall;

a means for actuating said means for heating air; said means for actuating being manually actuable and being electrically isolated to prevent electrical shock during manual actuation thereof;

whereby said inner enclosure and said means for actuating are shockproof; and

whereby air velocity of air leaving said slot is generally uniform along the length of said slot.

4,594,798

SHOE HEEL COUNTER CONSTRUCTION

James C. Autry, Dallas, Tex., and Lin Yung-Mao, Taichung, China, assignors to Autry Industries, Inc., Dallas, Tex.

Filed May 24, 1985, Ser. No. 737,519
Int. Cl.[4] A43B 23/17, 23/08
U.S. Cl. 36—68 12 Claims

1. A shoe counter comprising:

first and second counter portions spaced apart and shaped to conform to the heel of the wearer, said counter portions sufficiently stiff to provide support to the wearer's heel,

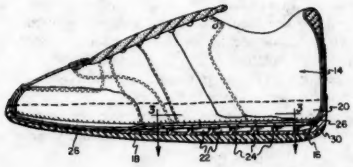
a hinge formed of relatively flexible material connected between said counter portions to better conform to the wearer's heel while providing flexibility to the counter.

4,594,799

TENNIS SHOE CONSTRUCTION

Yung-Ho Lin, Taichung, China, assignor to Autry Industries, Inc., Dallas, Tex.

Filed Dec. 10, 1984, Ser. No. 680,184
Int. Cl.[4] A43B 5/00, 13/14
U.S. Cl. 36—114 7 Claims



1. An athletic shoe comprising:

an outsole for disposal adjacent the sole of the foot;

a one-piece upper overlaying said outsole and secured thereto about the edges thereof, said upper adapted to overlay the dorsal and ventral surfaces of the foot to thus enclose the foot of the wearer;

said outsole having an upper layer for being disposed beneath said upper and further having a lower layer bonded to said upper layer for disposal adjacent the ground, said upper layer having side portions which extend upwardly to overlay and laterally surround said upper and being secured thereto, said upper layer also having integrally formed therewith on the top surface a plurality of recesses which extend across the entire width of the shoe and rearwardly from a point proximate the instep of the foot to the heel of the foot to provide increased flexibility to the outsole and to reduce the weight of the outsole; and

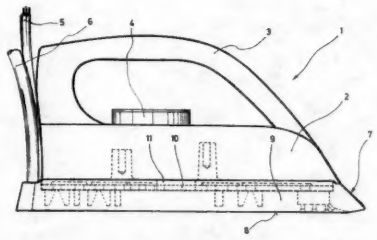
an insole positioned on said upper layer from about said point proximate the instep to the heel to overlay said recesses.

4,594,800

STEAM PRESSING IRON SOLE PLATE STRUCTURE

Eggert Herrmann, Gauting, Fed. Rep. of Germany, assignor to Veit GmbH & Co., Landsberg, Fed. Rep. of Germany

Filed Jul. 12, 1985, Ser. No. 754,471
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1984, 3435051; European Pat. Off., Jun. 12, 1985, 85107274.4
Int. Cl.[4] D06F 75/18, 75/10
U.S. Cl. 38—77.83 14 Claims



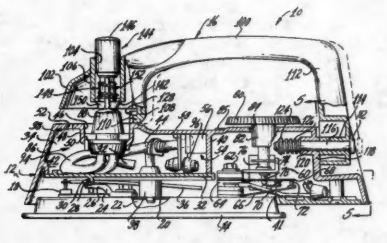
1. A steam pressing iron sole plate structure comprising a steam conduit system disposed above a pressing iron sole surface for supplying steam to steam outlet nozzles, said system including at least one recess being formed with a cylindrical wall extrending substantially perpendicular to said pressing iron sole surface, a steam supply channel opening tangentially through said cylindrical wall, and an outlet channel opening through a surface facing away from said pressing iron sole surface substantially coaxially with said cylindrical wall so that the steam entering through said supply channel is constrained to follow a helical flowpath.

4,594,801

TRAVEL IRON WITH PIVOTABLE HANDLE

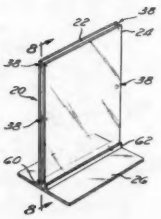
Jerry P. Gronwick, Park Ridge, and Robert J. Augustine, Downers Grove, both of Ill., assignors to John Zink Company, Tulsa, Okla.

Filed Jan. 23, 1985, Ser. No. 693,912
Int. Cl.[4] D06F 75/26, 75/34
U.S. Cl. 38—90 23 Claims



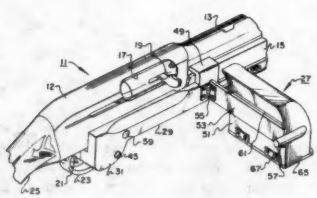
1. A pressing iron comprising a housing having a sole plate, a forwardly and rearwardly movable handle pivotally mounted at one end only on said housing for sidwise pivoting movement between an upright "use" position and a flat "storage" position, and stabilizing means provided on the other end of said handle and on said housing, said stabilizing means being operational only when said handle is in its upright "use" position.

4,594,802
DISPLAY DEVICE
Frank P. Field, 854 Napoli Dr., Pacific Palisades, Calif. 90272
Filed Apr. 11, 1984, Ser. No. 599,195
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—10 D **7 Claims**



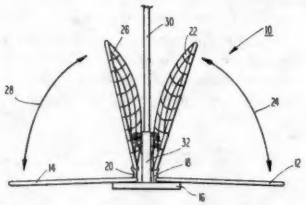
1. An improved device for displaying a card comprising:
a pair of plate members to be demountably fastened together to hold a card, said plate members being juxtaposed and spaced from one another by a distance sufficient to allow a card to be inserted from above the top edge of said plate members while said plate members are fastened together to reside between said plate members;
a ledge formed on the inside surfaces of said plate members adjacent their bottom edge for supporting said card between said plate members;
a base member adapted to detachably mount to said plate members;
plural pin and aperture assemblies located about the inside periphery of said plate members for detachably securing said plate members together in a juxtaposed orientation, each of said pin and aperture assemblies being comprised of a cylindrically-shaped pin extending outward from one said plate member and a complimentary hole formed in the other said plate member sized to engageably receive said pin, said plural pin and aperture assemblies being positioned adjacent each of the corners of said plate members, a pair of said plural pin and aperture assemblies being located adjacent the top edge of said plate members positioned to provide an auxiliary support surface adapted to receive a header card while said plate members are connected together and to support the header card placed between said plate members.

4,594,803
SPENT SHELL RECEIVER
Floyd B. Muncy, 4229 Voncille, Ft. Worth, Tex. 76117
Filed Jan. 28, 1985, Ser. No. 695,377
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—1 T **5 Claims**



1. For use with a gun having a barrel with an axis and a rearward end, a shell ejection slot located on one side adjacent the rearward end of the barrel, a spent shell receiver comprising in combination:
a bracket;
bracket mounting means for rigidly mounting the bracket to the gun adjacent the ejection slot;
a container having a window for receiving spent shells ejected from the ejection slot; and
container mounting means for mounting the container to the bracket for pivotal movement about an axis perpendicular to the axis of the barrel and forward of the ejection slot between a closed position for receiving shells wherein the window is aligned with the ejection slot, and an open position exposing the ejection slot.

4,594,804
CRAB TRAP
Michael G. Misko, 3610 Solly Ave., Philadelphia, Pa. 19136
Filed Jun. 15, 1984, Ser. No. 620,860
Int. Cl.[4] A01K *69/10*
U.S. Cl. 43—105 **9 Claims**

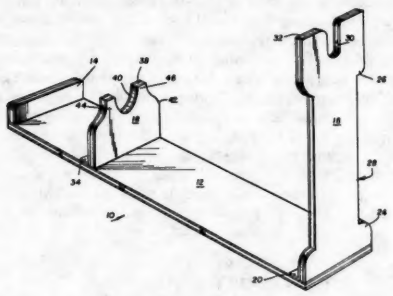


1. A marine animal trap with pneumatic actuation comprising:
(a) trap means including:
(1) at least one trap cover operable between an open and a closed position;
(2) means for biasing said trap cover in said closed position;
(3) means for releasably retaining said trap cover in said open position, said retaining means being pneumatically activatable by means for releasing said trap cover from said open position;
(b) actuating means for pneumatically activating said trap cover retaining means; and
(c) means for providing pneumatic communication between said actuating means and said activatable means of said trap cover retaining means.

4,594,805
FISHING ROD HOLDER
Paul R. McClelland, Rte. 1, Box 61, Coolville, Ohio 45723
Filed Mar. 19, 1985, Ser. No. 713,595
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 **5 Claims**

1. A fishing rod holder for supporting a fishing rod having handle, rod and reel portions and to prevent that rod and reel from coming into contact with the ground comprising a flat base member having an upper surface and two ends, a first wall member fixed at one end of said base member and extending above said upper surface a first predetermined height, second and third wall members each having two ends, one of which is pivotally attached to said upper surface, said second wall member being positioned between about 25% to 30% of the length of said base member from said fixed wall, the third wall member being attached at said other end of said base member, said second and third wall members extending above said upper surface at second and third predetermined heights, respectively, said first, second and third predetermined heights being about 5.5%, about 16.5% and about 66%, respectively of

the length of said base member, and wherein said second and third wall members each include in the other unattached end



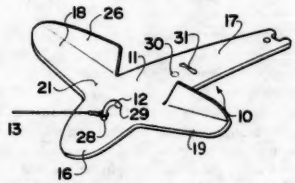
means defining an opening upwardly handle and rod receiving grooves, respectively.

4,594,806

FISHING LURE WITH FINS PROVIDING A SIDE TO SIDE MOTION

John L. Brown, 12 Amundsen Bay, Winnipeg, Manitoba, Canada R3K 0V2

Filed May 30, 1985, Ser. No. 739,193
Int. Cl.[4] A01K *85/04*
U.S. Cl. 43—42.18 9 Claims



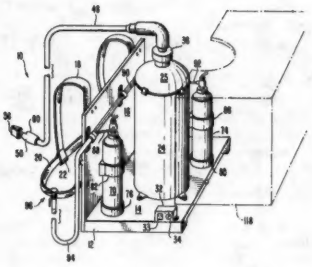
1. A fishing lure comprising a single piece lure body formed from substantially rigid material shaped so as to define an elongate body portion symmetrical about a longitudinal center line having a front end and a rear end and a pair of opposed rigid fins each integral with the body portion and extending outwardly from respective sides of the body portion such that the front end projects forwardly therefrom and the rear end projects rearwardly therefrom, said body being bent such that said front end forwardly of said fins turns downwardly and such that each fin is bent upwardly about a line longitudinal of the body portion and has a trailing edge thereof bent upwardly about a line longitudinal of each fin respectively, eyelet means for attaching a line to said body, said eyelet being provided on said center line and intermediate said front end and said rear end, and fish hook means attached to said body whereby the lure when pulled by the line moves from side to side without spinning.

4,594,807

CRAWLING PEST ELIMINATOR SYSTEM AND METHOD

Robert McQueen, 2744 Shipley Ter., SE., Washington, D.C. 20020

Filed May 31, 1985, Ser. No. 739,531
Int. Cl.[4] A01M *7/00, 11/00*
U.S. Cl. 43—132.1 33 Claims



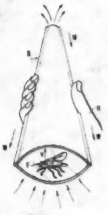
1. A crawling pest eliminator system comprising:
a frame,
a crawling pest flushing means supported on said frame for spraying a flushing agent and thereby flushing crawling pests out of their hiding places,
a vacuuming system supported on said frame,
said vacuuming system including a removable recovery container, a nozzle adapted to ride on surfaces for vacuuming into said recovery container the eggs of the crawling pests and the crawling pests themselves including those flushed out by said crawling pest flushing means, and an elongated vacuum hose operatively connected to said recovery container and said nozzle, and
a residual depositing means supported by said frame for depositing a pesticide residual on the surfaces which have been vacuumed of crawling pests and their eggs by said vacuuming system.

4,594,808

METHOD OF CATCHING FLIES

Yong S. Rhee, 251-1 Soo Yoo 2nd Dong, Dohbong-ku, Seoul, Rep. of Korea

Filed Sep. 27, 1985, Ser. No. 780,913
Int. Cl.[4] A01M *3/02*
U.S. Cl. 43—134 6 Claims



1. A method for trapping insects, comprising the steps of:
forming a pair of trapezoidal sheets which are substantially identical;
joining closed side edges of said sheets as they lie in overlying relationship to one another;
manually deforming said opposed edges toward one another to create an opening between said opposed sheets;

positioning said opposed sheets above an insect to be trapped;

release of manual pressure when the insect has entered a region between said opposed sheets;

said opposed sheets returning to their original undeformed condition trapping the insect.

4,594,809

CULTIVATION OF MORCHELLA

Ronald D. Ower, San Francisco, Calif.; Gary L. Mills, East Lansing, and James A. Malachowski, Haslett, both of Mich., assignors to Neogen Corporation, East Lansing, Mich.

Filed Apr. 29, 1985, Ser. No. 728,176

Int. Cl.[4] A01G *1/04*

U.S. Cl. 47—1.1 **34 Claims**

1. A method for culturing ascocarps of a species of the genus *Morchella* comprising

cultivating mycelis and attendent sclerotia of the species in the presence of a nutrient source that provides both organic and inorganic nutrients for a period of time sufficient for said sclerotia to store the nutrient supply needed for subsequent ascocarp development,

promoting maturation of mycelia and attendant sclerotia and inducing said mycelia into the sexual growth cycle of the species, and

maintaining conditions appropriate for development and maturation of ascocarps of the species.

4,594,810

INBRED CORN LINE

A. Forrest Troyer, DeKalb, Ill., assignor to DeKalb Pfizer Genetics, DeKalb, Ill.

Filed Feb. 21, 1985, Ser. No. 703,589

Int. Cl.[4] A01H *1/02*

U.S. Cl. 47—58 **10 Claims**

1. An inbred corn line having the designation HBA1.

4,594,811

HYDROPONIC PLANT CULTIVATION DEVICE

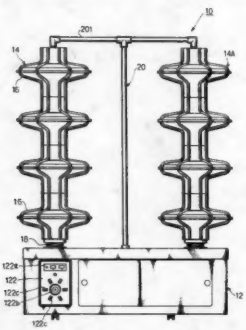
Toranosuke Tokoro, Tokyo, Japan, assignor to Dainichi Sangyo K. K., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,801

Claims priority, application Japan, May 30, 1984, 59-78571[U]

Int. Cl.[4] A01G *31/02*

U.S. Cl. 47—65 **6 Claims**



1. A hydroponic plant cultivation device comprising a cultivation tower formed by a plurality of cultivation units, stacked one unit on the other unit, each of said units having a lower structural element forming a chamber for accommodating a nutrient liquid therein to give nutrients to a plant to be cultivated and a hollow cylindrical member for allowing overflow of excess liquid to maintain the liquid level in said chamber constant, and an upper structural element having at a shoulder portion at least one window which is covered with a lid having at least one port for receiving the plant therethrough and fittingly mounted on the lower structural element; piping means arranged vertically in said cultivation tower through each of said stacked cultivation units having a nozzle arranged in each of said stacked cultivation units; a nutrient liquid source connected to said piping means for supplying liquid to each of said stacked cultivation units and communicated to a space below the bottom of the lowermost stacked cultivation unit in said cultivation tower for recovering liquid overflowed therefrom; pump means for feeding liquid from said nutrient liquid source to said piping means for causing liquid circulation through said cultivation tower; and means for rotary driving said cultivation tower and actuating said pump means.

4,594,812

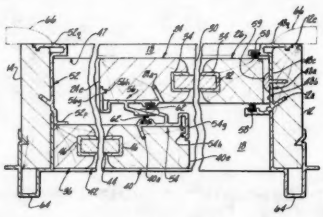
SLIDING DOOR CONSTRUCTION

Joseph S. Clancy, Union Lake, and Robert J. Heideman, Westland, both of Mich., assignors to Sash Controls, Inc., Ferndale, Mich.

Filed Nov. 1, 1984, Ser. No. 667,447

Int. Cl.[4] E05D *15/06*

U.S. Cl. 49—404 **18 Claims**



1. A cladding and sealing kit for use with a sliding sash construction of the type including a plurality of elongated wooden members arranged to form the frames of the fixed and sliding sashes and the jambs and header of the sash opening, said kit comprising a plurality of elongated cladding and sealing members, each cladding and sealing member formed of resilient material and including:

a. an elongated flat main body portion defining a longitudinal front face and a longitudinal rear face adapted to be placed against a longitudinal side surface of an elongated wooden member;

b. a longitudinal fulcrum rib portion extending from the rear face of said main body portion and angled toward one end of said main body portion for coaction with a complimentarily angled longitudinal slot formed in the longitudinal surface of the wooden member;

c. a longitudinal cantilever flange portion extending generally perpendicularly away from the rear face of said main body portion adjacent and one end thereof and defining a longitudinal inner face confronting said fulcrum rib portion; and

d. a longitudinal lip portion formed adjacent the free end of said cantilever flange portion and extending from the inner face of said cantilever portion toward said fulcrum rib portion for coaction with a complimentary longitudinal slot formed in a longitudinal edge surface of the elongated wooden member forming a corner with the longitudinal side surface of that member,

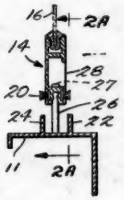
whereby said cladding and sealing members may be snappingly and removably secured to the longitudinal side surface of respective wooden members by inserting said flange rib portion into the angled slot in the longitudinal side face of the respective wooden member and thereafter pivoting said cladding member about said fulcrum rib

portion to cam the leading edge of said flange portion over the corner of the respective wooden member and snap said lip portion into the slot in the edge surface of the respective wooden member.

4,594,813
WINDOW VENT

Maurice E. Sterner, Jr., York, Pa., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,580
Int. Cl.[4] E05D *13/00*
U.S. Cl. 49—450 **3 Claims**

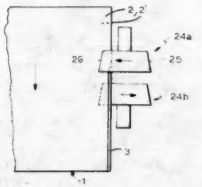


1. In a window sash of the kind which in use is vertically movable within a stationary frame, an assembly for holding the sash at an elevated, partially open position in the frame comprising: at least one stop element carried within a downwardly open recess in said sash and mounted in said recess for free sliding movement in the plane of the sash between a retracted position in the recess and an extended position in which a portion of the stop element protrudes out of said recess; and a manually operable latch carried by said sash selectively operable to hold said stop element in its extended position and to release said element for free sliding movement within said recess, whereby raising of said sash in its frame allows said stop element to move to its extended position and whereby said element may then be latched in its extended position.

4,594,814
MACHINE FOR AND METHOD OF CHAMFERING OF EDGES OF PLATE-SHAPED WORKPIECES, PARTICULARLY GLASS DISKS

Egon Olszewski, Paderborn-Elsen; Klaus-Dieter Schaper, Paderborn-Schloss Neuhaus, and Uwe Werner, Enger, all of Fed. Rep. of Germany, assignors to Benteler-Werke AG, Paderborn, Fed. Rep. of Germany

Continuation of Ser. No. 527,305, Aug. 29, 1983, abandoned.
This application Aug. 7, 1985, Ser. No. 763,422
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231895
Int. Cl.[4] B24B *9/00*
U.S. Cl. 51—40 **2 Claims**

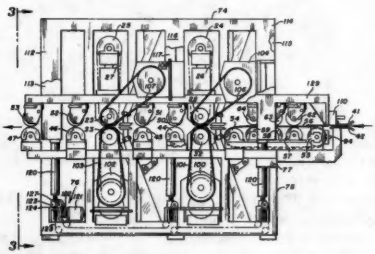


1. A machine for simultaneously chamfering two elongated edges which limit an end surface of a plate-shaped workpiece having two outer surfaces at both sides of the end surface and a thickness between the outer surfaces so as to form two chamfers spaced from one another in direction of the thickness, the machine comprising two peripheral grinding wheels each having an axis of rotation, said grinding wheels being movable relative to said workpiece and rotatable about the axes of rotation in opposite directions each from a respective one of the outer surfaces toward the end surface and also movable along a respective one of the edges with an offset relative to one another so as to grind two chamfers, said peripheral grinding wheels being formed as truncated cones oriented with the diameters thereof decreasing in the direction of movement relative to the workpiece and arranged so that their axes of rotation during grinding extend substantially parallel to the edges to be chamfered; and means for moving and rotating said peripheral grinding wheels.

4,594,815
ABRASIVE SURFACER

Maurice G. Mickelson, and Herman J. Mutzberg, both of Minneapolis, Minn., assignors to Timesavers, Inc., Minneapolis, Minn.

Continuation of Ser. No. 509,793, Jul. 1, 1983, abandoned, which is a continuation of Ser. No. 258,613, Apr. 29, 1981, abandoned.
This application Dec. 7, 1984, Ser. No. 679,285
Int. Cl.[4] B24B *21/04*
U.S. Cl. 51—138 **8 Claims**



1. A driven feed assembly for an abrasive surfacer having at least one pair of vertically spaced apart upper and lower abrasive heads, the feed assembly comprising:

(a) feedworks means including opposed upper and lower conveying assemblies each mounted to a frame and relative to a reference center plane between said upper and lower abrasive heads for substantially centering the upper and lower surfaces of workpieces relative to the center plane and for conveying the workpieces longitudinally past said upper and lower abrasive heads so as to cause each workpiece to simultaneously and substantially equally engage the upper and lower abrasive heads as they are conveyed thereby;

(b) said upper conveying assembly comprising a plurality of resilient and passive upper pinch rollers, each pinch roller comprising a generally transverse row of upper pinch wheels mounted to contacting workpieces passing thereunder, wherein each of said pinch wheels includes inner and outer annular layers of different hardness, each inner annular layer comprising a relatively soft and resilient material, each outer annular layer comprising a relatively harder material said wheels independently contacting and, by elastic deformation of their respective inner and outer layers, applying a corrective downward force to the opposed upper surface portion of the workpieces along contact lines as the workpieces pass thereunder;

(c) said lower conveying assembly comprising an endless driven conveyor belt having a pluraity of passive and resilient idler rollers mounted between an associated drive conveyor roller and an idler conveyor roller and contacting the inside upper surface of said conveyor belt in opposed relationship to said upper pinch rollers and substantially parallel to the contact lines of said upper pinch rollers, whereby said idler rollers, acting through said

conveyor belt, apply corrective upward forces to the workpieces as they are conveyed thereover by said conveyor belt; and

(d) a pneumatic spring means for independently biasing each of said upper pinch wheels downward against its associated one of said workpieces, and for permitting upward movement of said upper pinch wheels in response to a portion of unusual thickness of warpage in said workpiece.

4,594,816

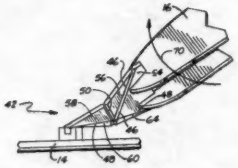
UNIVERSAL HINGE-TYPE JOINT

Edward J. Goldstein, Minneapolis, Minn., assignor to Padco, Inc., Minneapolis, Minn.

Continuation of Ser. No. 653,471, Sep. 20, 1984, abandoned, which is a continuation of Ser. No. 356,925, Mar. 10, 1982, abandoned. This application Aug. 23, 1985, Ser. No. 768,184

Int. Cl.[4] B24D *15/00*

U.S. Cl. 51—393 **21 Claims**



1. A flexible force transmitting joint in combination with a first implement member and a second implement member, the joint comprising:

an integral body having a first end for connection to the first implement member and a second end for connection to a second implement member; having a plurality of substantially rigid sections; and having first, second and third flexible portions defining non-parallel axes of rotation separating and flexibly connecting the rigid sections to each other, each of the axes of rotation intersecting a longitudinal central axis which extends between the first and second ends and intersecting the other axes of rotation, two of the axes being oriented diagonally with respect to the longitudinal central axis and intersecting each other in an "X" configuration and one of the axes being oriented essentially perpendicular to the longitudinal central axis, the body being bendable along the flexible portions to allow transmission of force from the second to the first implement member generally along the longitudinal central axis with the second implement member in a wide range of angular positions with respect to the first implement member, the flexible portions being positioned to permit bending simultaneously about multiple axes of rotation.

4,594,817

MODULAR SLEEPING UNITS

Charles L. McLaren, 1911 Pear Creek Cir., Houston, Tex. 77084, and Franklin D. Hirsekorn, 105 Rosamond, Houston, Tex. 77076

Filed Aug. 31, 1982, Ser. No. 413,563

Int. Cl.[4] A47B *83/00*

U.S. Cl. 52—34 **22 Claims**

1. A modular sleeping structure comprising

a building enclosure having at least one doorway and door for entrance and exit,

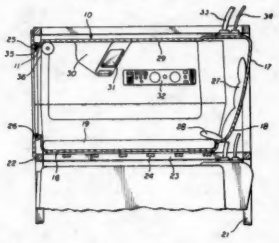
a plurality of sleeping modules in said building enclosure,

some of said modules being supported in vertical columns of at least two modules,

each of said modules being of elongated box shaped construction with an open entrance end, a closed end, and closed top, bottom and side walls,

said modules each comprising an upper and a bottom part of a formed sheet plastic material and fitting together to form said open ended box shaped structure,

said modules each being the size of a standard single bed and a height just sufficient for an occupant, of normal size, up to about six feet three inches in height, to sit upright but less than standing height,



said closed end of each module being flat along opposite sides thereof with a central portion extending outward between said flat sides to form a bulge of recess with side walls between which a person may sit upright,

each said bulge or recess at said closed end being of a shape defining a comfortable back rest extending from side to side partially around the person sitting therein,

a mattress covering the floor, a vertically-extending back cushion fitting the back wall of said closed end bulge, and

openings in said closed walls provided with connections for air conditioning, ventilation and lighting.

4,594,818

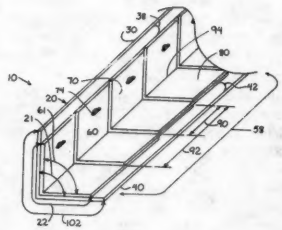
APPARATUS FOR ATTACHING FLASHING TO A ROOF

Pat A. Prestidge, 641 Illinois Ave., Elgin, Ill. 60120

Filed May 3, 1985, Ser. No. 730,210

Int. Cl.[4] E04D *1/36*

U.S. Cl. 52—58 **17 Claims**



1. A flashing attachment including a flashing support with a plurality of pieces of flashing secured thereto, wherein:

a. said flashing support further includes a wall flap and a roof flap;

b. said flashing support includes a flashing area partially covered by said flashing;

c. said wall flap includes a plurality of flap slots;

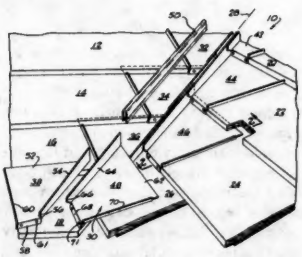
d. each of said flap slots include a slot bottom and a slot top;

e. said slot bottom and said slot top are oppositely disposed and spaced sufficiently to provide for said flashing to be adjusted into position and receive various thicknesses of roofing material;

f. said wall flap includes a wall flap extension extending beyond said flashing area;

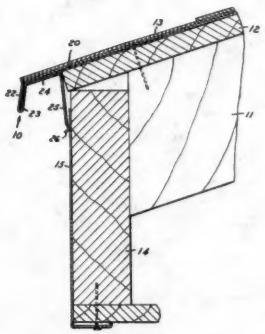
g. said wall flap extension is used to secure said flashing support to a house wall;
h. said roof flap rests under roofing material; and
i. said roof flap includes a roof flap extension extending beyond said flashing area.

4,594,819
ROOF FLASHING FOR USE WITH ROOF PLANKING
Joseph P. Kneisel, 188 S. Sidlee St., Thousand Oaks, Calif. 91360
Filed Feb. 27, 1984, Ser. No. 583,613
Int. Cl.[4] E04D 1/36
U.S. Cl. 52—60 **4 Claims**



1. Roof flashing installed on Roof Planking of the type which will form a weather-proof seal at roof valleys which comprises:
first and second lengths of roofing board each having an upper surface, a lower surface, a front longitudinal edge and an angled intersecting edge, each board having its upper surface at a slight angle with respect to its lower surface;
first and second flashing elements each element having a first flat, roof-engaging surface abutting the upper surface of said one of said lengths of roofing board at the intersecting edge thereof each of said elements having:
an integrally formed, downwardly-directed flange portion along one edge of said flat, roof-engaging surface and normal to said surface sand flange portion abutting said front edge of each of the roofing boards;
an upwardly directed elongated wall portion integrally formed with said flat, roof-engaging surface and at an edge adjacent said downwardly projecting flange portion and said wall portion lying along said intersecting edge of each of said roofing boards, the upper edge of said upwardly directed wall portion is parallel to an imaginary straight line intersecting the front longitudinal edges of adjacent boards and the upwardly directed wall portion of one flashing element abutting the upwardly directed wall portion of the other flashing element, the downward edge of said wall portion extending upwardly a distance sufficient to contact the generally U-shaped attaching element;
an upwardly directed reinforcing wall integrally formed with said flat roof engaging surface at the edge of the flashing element which is opposite the upwardly directed elongated wall portion, said reinforcing wall extending from about said downwardly-directed flange along a majority of the length of edge of the flashing element but terminating at a point removed from the other adjacent edge of the flashing element; and
a generally U-shaped attaching element frictionally affixed over the intersection of the two upwardly directed elongated wall portions.

4,594,820
DRIP EDGE ROOF MOULDING
Tommee E. Render, P.O. Box 245, Lewiston, Mich. 49756
Filed Oct. 1, 1984, Ser. No. 656,642
Int. Cl.[4] E04B 7/00; E04D 13/00
U.S. Cl. 52—60 **8 Claims**

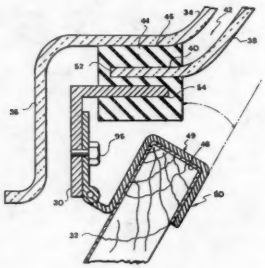


1. In a building comprising an inclined roof including roof sheathing and roofing overlying the sheathing and having a free edge including a general vertical fascia board substantially aligned vertically with the free edge of said roof, a drip edge roof moulding construction for placement at the lower edge of an inclined roof beneath the roofing to direct flow of water away from the fascia board comprising
an elongated strip comprising
a first flat portion positioned beneath the roofing in overlying relation to the roof sheathing, means extending through said flat portion for holding said strip in position on said roof sheathing and comprising substantially the sole means for holding said strip in position
said flat portion extending outwardly beyond said free edge of said roof and the plane of said fascia board,
a second generally flat portion integrally connected to the edge of said first flat portion and extending downwardly from the lower edge of the first portion at an obtuse angle with respect to the first portion,
a third portion integrally connected to said second portion and extending along the second portion toward the first portion such that water falling on the roof is directed by gravity downwardly from the juncture of the second portion and third portion,
the length of said third portion being sustantially equal to the length of said second portion,
a fourth portion integrally connected to the edge of said third portion extending along the underside of the first portion in abutting relation thereto,
a fifth portion integrally connected to the edge of said fourth portion and extending downwardly at an acute angle approaching 90° with the fourth portion and engaging the fascia board, and
a sixth lip portion integrally connected to the edge of the fifth portion and extending downwardly and outwardly at an obtuse angle to the fifth portion.

4,594,821
SKYLIGHT ASSEMBLY

Paul E. Bechtold, 26 Kaywood Rd., Port Washington, N.Y. 11050, and Stephen K. Bechtold, 28 Soundview Ave., East Northport, N.Y. 11731

Continuation of Ser. No. 492,409, May 6, 1983, abandoned, which is a continuation of Ser. No. 172,381, Jul. 25, 1980, abandoned. This application Feb. 27, 1985, Ser. No. 706,236
Int. Cl.[4] E04B 7/16; E04D 13/03
U.S. Cl. 52—72 3 Claims

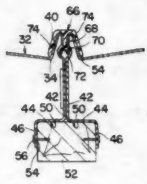


1. In a skylight and roof assembly including a skylight portion mounted over an opening in the roof and pivotable between open and closed positions and of the type including an inner dome and an outer dome spaced from one another, a sealing extrusion around the periphery of the domes to sealingly engage with the remainder of the skylight and roof assembly when the skylight portion is in the closed position, the periperal edge of the inner dome mounted to the extrusion and the outer dome having a portion adjacent its outer edge on sealing engagement with the extrusion and the outer edge extending beyond the extrusion and into overlying spaced position with respect to the remainder of the skylight and roof assembly and engageable therewith when the skylight portion is opened to limit the extent to which the skylight portion can be opened, the improvement comprising; at least one hinge mounted on the assembly, each hinge including a first leg mounted on the movable portion of the assembly in a fixed position and a second leg mounted in fixed position on the fixed portion of the assembly, a flange extending from the second leg, and mating surfaces on the first leg and the flange receiving coupling means for pivotally interengaging the first and second leg by the flange therebetween so that the skylight can be pivoted between the open and closed positions along a desired arcuate path, the first leg having means thereon for mounting the first leg to the movable skylight portion, the second leg being U-shaped in configuration to capture a fixed portion of the assembly therein to be mounted thereon in fixed position, the flange having a predetermined size and the surfaces to receive the coupling means on the end of the flange being distal from the U-shaped leg, to permit pivoting of the movable skylight portion with respect to the fixed portion of the assembly so that it covers the roof opening when in the closed position with the extrusion in sealing engagement with the remainder of the skylight and roof assembly about substantially the entire periphery thereof and substantially across the width of the sealing extrusion and can be opened to expose the roof opening by pivoting the movable skylight portion more than 90 degrees away from the closed position by providing the outer edge of the upper dome with sufficient spacing from the fixed portion of the skylight and roof assembly.

4,594,822
STRUCTURAL PANEL FOR BUILDING STRUCTURE

Howard J. Marschak, 2030 Silvertip La., Long Beach, Michigan City, Ind. 46860

Filed May 2, 1983, Ser. No. 490,247
Int. Cl.[4] E04B 7/02
U.S. Cl. 52—90 20 Claims



14. A building structure having at least one side wall and a roof inclined upwardly from said side wall with the side walls and roof being formed from preformed panels of sheet material, each of said panels having a one piece main body and opposite lateral edges with first flanges depending substantially perpendicular from said main body adjacent said lateral edges and first flanges of adjacent panels being in abutting relation with interconnecting means on said first flanges for interconnecting adjacent panels, second flanges extending substantially perpendicular from said first flanges under said main body, and third flanges depending perpendicular from ends of said second flanges opposite said first flanges, the distance between adjacent third flanges being dimensioned to define a space equal to the width of a standard building stud, and means on an upper end of said wall for supporting said roof on said side wall.

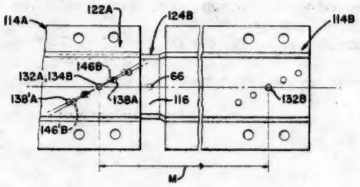
4,594,823
PANEL SUPPORT ASSEMBLY FOR CONCEALED FASTENER ROOF STRUCTURE

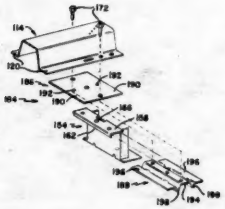
James G. Hague, Box 159C, Davidson Rd., Mars, Pa. 16046

Continuation of Ser. No. 427,655, Sep. 29, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,517
Int. Cl.[4] E04B 7/02; E04C 3/30
U.S. Cl. 52—90 21 Claims

1. A subgrit for supporting panel members, including
an upper wall having a longitudinal centerline;
first and second ends adapted for telescoping engagement with the second and first ends of adjacent subgirts;
a first set of apertures in the upper wall at the first end, apertures of said first set being uniformly spaced-apart at a first distance;
a second set of apertures in the upper wall at the second end, the apertures of said second set being uniformly spaced-apart at a second distance different from said first distance;
said first set and said second set including reference apertures which are spaced-apart at a distance substantially equal to a selected modular width; and
locking means for locking the first and second ends of adjacent subgirts in an adjusted relationship;
whereby during movement of the second end of said adjacent subgirt relative to the first end, successive pairs of corresponding apertures are presented in coaxial alignment, each of said successive pairs comprising an aperture from said first set and an aperture from said second set,

one of said pairs being selected to set the distance between the reference aperture at the first end of said adjacent





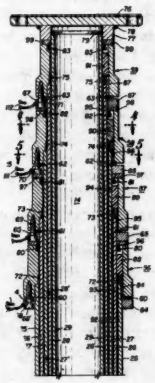
subgirt and the reference aperture of the first end of said subgirt.

4,594,824

TELESCOPING TOWER FOR FLOODLIGHTING EQUIPMENT AND THE LIKE

Theodore J. Ziegler, Golden; Alexander Eydelman, Littleton; Frederick G. Koether, Boulder, and Robert A. Lawrance, Lakewood, all of Colo., assignors to Over-Lowe Company, Inc., Englewood, Colo.

Filed Mar. 29, 1982, Ser. No. 363,058
Int. Cl.[4] B66C *23/06*
U.S. Cl. 52—118 **16 Claims**



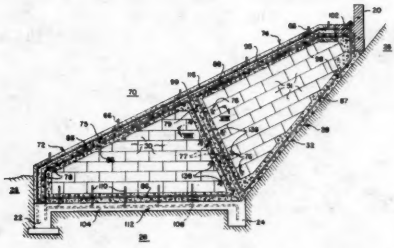
1. A telescoping tower mast assembly or the like for elevating equipment to a raised position comprising a hollow cylindrical base member and at least one extensible hollow cylindrical member telescoped within said base member, means for admitting pressurized fluid to the interior of said assembly for raising said assembly and for releasing the fluid for lowering the assembly, seals on said members including a seal near the outer end of said base member slidably engaging the next smaller member for preventing the leakage of fluid between said members, means for preventing the escape of fluid through the innermost of said members, means providing open communication through said cylindrical members from said pressurized fluid admitting means to said fluid escape preventing means, each of said members except the innermost member having a fitting at its outer end and respective ones of said seals being mounted in respective ones of said fittings for engagement with the external wall of the inner member slidable therein, a piston block at the inner end of each of said inner members, a first wear and spacing ring on each of said piston blocks for sliding engagement with the next outer member for maintaining adjacent members in predetermined spaced relationship, a second wear and spacing ring mounted on each of said inner members, means for preventing longitudinal displacement of each of said wear and spacing rings with respect to the member on which it is mounted, said second rings spaced a distance from the respective first ring which determines the length of overlap of said members when fully extended, and a third wear and spacing ring mounted internally on each of said fittings for maintaining the spacing of said members adjacent said fittings and for engaging the respective one of said second rings to act as a stop limiting the outward movement of the respective inner member, said wear rings being constructed of a low friction plastic material and the mounting of said wear rings on said members affording slight relative movement of the rings radially with respect to the members on which they are mounted for facilitating the smooth movement of said members with respect to one another.

4,594,825

CANTILEVERED SUPPORT MEMBER AND FOUNDATION UNIT

Guy M. Lamarca, 1928 Walton Ave., Pittsburgh, Pa. 15210

Continuation-in-part of Ser. No. 283,568, Jul. 15, 1981, abandoned. This application Jan. 25, 1985, Ser. No. 695,165
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—169.4 **10 Claims**



1. In a foundation unit constructed on a hillside for supporting a structure thereon, wherein said hillside is excavated to provide a horizontal surface and an inclined surface, and wherein said foundation unit is constructed on said horizontal surface and includes a floor, a rear wall confronting said inclined surface, a front wall and at least two opposing side walls adapted to lie in a vertical plane perpendicular to said horizontal surface, the improvement in each of said side walls comprising;

said side wall being defined by a support section and a cantilevered section;

said support section having a perimeter generally defined at least in part by a lower horizontal edge parallel to said horizontal surface, an upper edge and an upwardly directed line, said lower horizontal edge having a first end and a second end, said upwardly directed line extending

through said vertical plane from about said first end of said lower horizontal edge to about an end of said upper edge;

said cantilevered section being attached to said support section along said upwardly directed line and having a perimeter generally defined by said upwardly directed line, a top edge having a first end and a second end, an inclined edge extending upwardly and outwardly at an obtuse angle relative to said lower horizontal edge from about said first end of said lower horizontal edge, and a junction joining said second end of said top edge to the upper most porton of said inclined edge, said first end of said top edge being attached to said end of said upper edge of said support section, said support section and said cantilevered section being preformed subunits adapted for attachment to each other along said upwardly directed line;

said upper edge and said to edge defining a top surface of said wall, said top surface being adapted to abut said structure when said structure is constructed on said foundation unit; and

said obutse angle of said inclined edge of said cantilevered section being sufficiently obtuse that when said structure is constructed on said foundation unit the weight of said structure bearing against said cantilevered section is shifted to c .d borne by said support section, said cantilevered section permitting an increase in the usable space of said structure without requiring a corresponding increase in said lower horizontal edge of said side wall extenidng into said hillside.

4,594,826

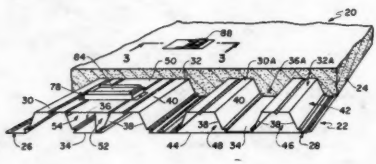
FIELD-ASSEMBLED RACEWAY FORMING MEMBER

Charles R. Gray, Coraopolis, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jun. 22, 1984, Ser. No. 623,709

Int. Cl.[4] E04B *5/48*

U.S. Cl. 52—221 **10 Claims**



1. An electrical wiring distributing floor structure comprising a metal subfloor and an overlying layer of concrete, said metal subfloor including:

a distribution unit comprising at least first and second longitudinal, spaced-apart inverted channels presenting spaced crests, said channels being connected by a web positioned therebetween and joining said channels to form a trough; and

a raceway forming member comprising:

a cover member substantially coextensive in length with said channels and at least coextensive in width with said trough, said cover member including edge means adapted to engage said first and second channels, said cover member having a hat-shaped transverse profile, being disposed above the level of said spaced crests, and providing a housing substantially coextensive in length with said trough.

4,594,827

TENSION MEMBER, PARTICULARLY FOR USE AS A DIAGONAL CABLE IN A STAYED GIRDER BRIDGE

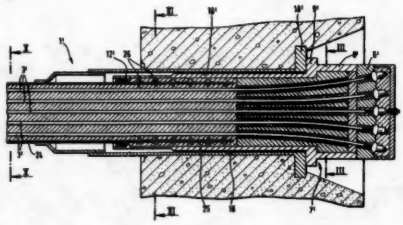
Klemens Finsterwalder, Berg, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 426,189, Sep. 28, 1982. This application Sep. 24, 1985, Ser. No. 779,591

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138807

Int. Cl.[4] E04C *3/10*

U.S. Cl. 52—230 **7 Claims**



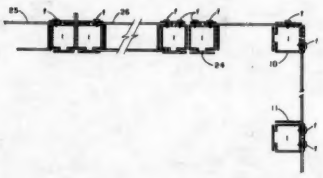
1. A stressed tension member anchored at the ends thereof for transferring tensile force into a support structure and being unsupported between the ends, said tension member being free of composite action with the support structure, said tension member can be used as a diagonal cable for a stayed girder bridge and is comprised of a plurality of individual elements, such as steel rods, steel wires or steel strands, with said individual elements disposed in parallel relation for an axially extending length thereof between the ends of said tension member, an axially extending tubular casing laterally enclosing said parallel individual elements, and a cement grout filled into the open spaces within said tubular casing around said individual elements after said individual elements are tensioned, an anchoring system for an end of said individual elements comprising an anchoring disc having a plurality of bores extending therethrough and arranged to receive one of said individual elements in each of said bores, means for securing said individual elements to said anchoring disc, wherein the improvement comprises that said anchoring disc is spaced along said individual elements from the adjacent end of said tubular casing, an axially extending steel anchoring pipe is located and extends between said anchoring disc and said tubular casing and laterally encloses said individual elements extending therebetween, said individual elements arranged to be enclosed by a groutO-like material within said anchoring pipe between said anchoring disc and the adjacent said tubular casing, said anchoring pipe having a first end and second end spaced apart in the axial direction of said anchoring pipe, the first end of said anchoring pipe is disposed in contact with said anchoring disc and said anchoring pipe is arranged to support said anchoring disc on the support structure, the second end of said anchoring pipe is located adjacent to said tubular casing, said anchoring pipe includes an annular collar encircling said individual elements and spaced between and from the first and second ends of said anchoring pipe so that said collar is spaced from said anchoring disc, and said annular collar forms a support shoulder for supporting said tension member on the support structure so that the support for said anchoring disc on the support structure is spaced in the axial direction of said anchoring pipe from said anchoring disc and is located between the first and second ends of said anchoring pipe.

4,594,828

BUILDING CONSTRUCTION SYSTEM INCLUDING A PROFILE EXTRUSION USED AS A UNIVERSAL STRUCTURAL MEMBER AND ASSEMBLY CLIPS THEREFOR

Curtis P. Taylor, Bexly, Ohio, assignor to Plaskolite, Inc., Columbus, Ohio

Filed Mar. 8, 1985, Ser. No. 709,538
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—282 3 Claims



1. A universal structural profile extrusion including

a longitudinally extending structural form having a rectangular cross section defined by four wall segments in which:

from a first wall segment there extends an intrinsic "T" shaped member to form separate, oppositely facing first and second channels between the first wall segment and the "T", each of said channels adapted to receive the side section of a panel of predetermined thickness;

from a second wall segment, adjacent and perpendicular to the first wall segment, there extends a channel forming leg parallel to the second wall segment, having a foot intrinsically connected to the corner of the first and second wall segments of the rectangular form, whereby a third channel is formed which is perpendicular to and facing away from the adjacent channel formed by one side of the "T" on the first wall segment, said third channel adapted to receive the side section of a panel of predetermined thickness;

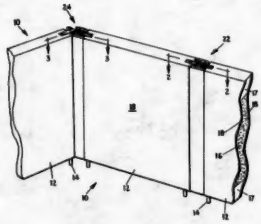
from a third wall segment opposite the first wall segment, there extends an intrinsic "pi" shaped section, in which the section corresponding to the cross bar of the "pi" does not extend beyond the second wall segment and the opposite fourth wall segment of the rectangular form, and forms two oppositely facing channel slots having opposite internal sides of a determined spacing.

4,594,829

JOINT INTERLOCKING SYSTEM

Donald E. Herrgord, 85 S. Green Creek Rd., Muskegon, Mich. 49445

Filed Aug. 5, 1983, Ser. No. 520,812
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—285 15 Claims



1. In a joint interlocking system for interconnecting panels or similar articles in various structural configurations and comprising joint assemblies for interlocking adjacent panels, each of said panels having two opposing ends, the improvement wherein each of the joint assemblies comprises:

spline means secured to the panels for providing a panel connecting structure, and comprising a plurality of T-shaped splines, each spline having a center flange secured to an associated panel end, at least two extending arms projecting laterally from the center flange, a lip at the end of each arm projecting toward the panel end and a spline bead at the end of each lip projecting inwardly toward the center flange;

connector means for selectively interconnecting the spline means associated with different panels, and having a cross bracket, legs connected to terminating portions of the cross bracket and projecting laterally therefrom, a retaining lip at the end of each leg, a connector bead on the end of each lip and inwardly directed toward the cross bracket, and connector pockets each formed by the cross bracket, one of the legs, and the retaining lip and connector bead associated with the leg;

each of the T-shaped splines is secured to an associated panel end so that the distance between the spline center flange and each spline lip is less than the distance from the center flange to the edge of the associated panel end;

the distance between the end of each spline bead and the face of an associated panel end is larger than the thickness of each connector leg so as to allow interlock of a spline and a connector with positioning of connector legs between spline beads and panel ends; and

the distance between the end of each spline bead and the face of an associated panel end is smaller than the diameter of each connector bead so as to prevent the connector beads from passing between the spline beads and the faces of associated end panels;

whereby the spline beads can be captured within the connector pockets so as to provide sliding interlocking joints therebetween; and

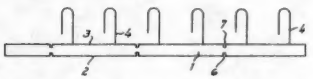
the relative sizes and structure of the spline means and the connector means provide a joint assembly interlocking at least two panels wherein either panel can be pivoted relative to the other panel and the connector means, while maintaining an interlocked relationship with the connector means.

4,594,830

BONDING UNIT FOR REINFORCED CONCRETE STRUCTURAL COMPONENTS

Klaus Matz; Gerhard Ritter, and Klaus Ritter, all of Graz, Austria, assignors to AVI Alpenl. Veredelungs-Industrie GmbH, A-Graz, Austria

Filed Dec. 5, 1983, Ser. No. 558,322
Claims priority, application Austria, Dec. 13, 1982, 4525/82
Int. Cl.[4] E04B *1/41*
U.S. Cl. 52—334 4 Claims



1. A unit for bonding two structural reinforced concrete components, said unit comprising a mounting strip having a pair of oppositely directed main faces and a plurality of connector rods held firmly on said mounting strip, portions of said connector rods projecting at intervals along one main face of said mounting strip and said connector rods having arms bent to a knee shape, said arms being positioned within said mounting strip, wherein one of said main faces of said strip on the side away from the projecting portions of said connector rods defines at least two grooves parallel with one another and extending in the longitudinal direction of said mounting strip,

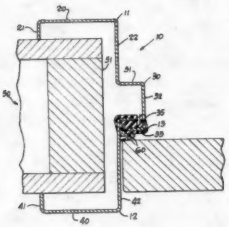
said grooves having a depth at least equal to said diameter, said mounting strip further including holes at intervals along its length, said holes extending from the bottoms of respective ones of said grooves toward said opposite main face of said mounting strip, the connector rods being disposed individually through said holes, said arms of said connector rods being arranged and held firmly within said grooves, said bonding unit further including a plurality of clips, said clips holding said arms of said connector rods in said grooves.

4,594,831

STEEL DOOR FRAME WITH THERMAL BREAK

Rodney W. Winyard, Warren, Ohio, assignor to American Welding & Manufacturing Co., Warren, Ohio

Filed Feb. 25, 1985, Ser. No. 705,142
Int. Cl.[4] E04B *1/64;* E06B *1/32*
U.S. Cl. 52—395 7 Claims



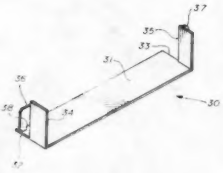
1. A thermal break frame suitable for framing a wall opening comprising a pair of metal members each having an edge flange along one side, and a one-piece plastic thermal break element adapted to be positioned between and to lockingly engage said edge flanges, thereby connecting said metal members together, said thermal break element having spaced apart, longitudinally extending, oppositely facing, L-shaped channels adapted to receive said edge flanges and to maintain them in spaced relation.

4,594,832

SPACER

Dorman C. Akins, 3510 Norris Dr., Houston, Tex. 77025

Filed Aug. 11, 1983, Ser. No. 522,001
Int. Cl.[4] E04B *1/38, 5/52*
U.S. Cl. 52—715 2 Claims



1. A spacer comprising:

A body member having opposed ends;

A tab member perpendicularly depending from each of said opposed body member ends, one of said opposed tab members is of lesser width than the others; and

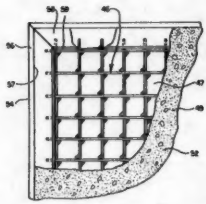
locking means perpendicularly depending from each of said tab members, said locking means including a planar ear having a locking lip formed by a cut-out at one end thereof immediately adjacent the juncture of said ear and its associated tab member.

4,594,833

HONEYCOMB FLOOR PANEL AND THE LIKE

David F. Mieyal, Strongsville, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Division of Ser. No. 555,142, Nov. 25, 1983, Pat. No. 4,573,304.
This application Oct. 2, 1985, Ser. No. 783,127
Int. Cl.[4] E04C *2/08*
U.S. Cl. 52—806 5 Claims



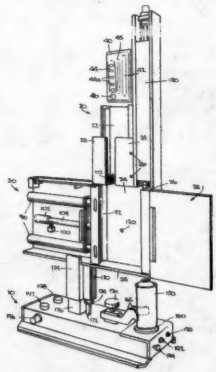
1. A rectangular floor panel for elevated floors adapted to be supported at its corners, comprising a honeycomb assembly providing interconnected honeycomb walls cooperating to define a multitude of small cells, a metal lower cover sheet secured to said honeycomb assembly along one side thereof, a layer of settable material along the side of said honeycomb assembly opposite said cover sheet providing the surface of said panel opposite said lower cover sheet, said layer of settable material providing substantial compressive strength and limited tensile strength, the side of said honeycomb assembly opposite said cover sheet being embedded in said layer and mechanically locked thereby to said layer, said layer being spaced from said cover sheet by said honeycomb assembly a distance greater than one-half the thickness of said panel, loads applied to said layer creating stresses therein in compression without any substantial tensile stress, and upstanding walls extending around the edges of said panel connecting said layer and said cover sheet.

4,594,834

CONTAINER STUFFING APPARATUS AND METHOD

Richard Schmidt, Ambler, Pa., and Joseph A. Pizzo, Sr., Cherry Hill, N.J., assignors to Enviro-Spray Systems Incorporated, Montgomeryville, Pa.

Filed Feb. 25, 1985, Ser. No. 704,595
Int. Cl.[4] B65B *63/02, 63/04*
U.S. Cl. 53—117 36 Claims



1. Apparatus for inserting flexible sheet products into containers, each of said products comprising an expandable pouch

for pressurizing a container, said pouch including burstable means for generating pressurizing gas within said pouch, said apparatus comprising:

first plate means;

second plate means extending parallel to and adjacent said first plate means and spaced apart therefrom, said sheet product being received between said first and second plate means;

actuating means for relatively moving said first and second plate means toward each other so as to compress said flexible sheet product to burst said burstable means;

means for deforming said sheet product into an elongate shape, said means for deforming comprising means having a generally flat internal chamber for receiving said flexible sheet product from said first and second plate means defined by first and second opposing surfaces and first and second ends, and pusher means mounted in said chamber extending along said first end, means for moving said pusher means laterally toward and away from the second end, for deforming said flexible sheet product in said chamber into an elongate folded sheet product extending along and against the second end, said generally flat internal chamber having means for moving said flexible sheet product substantially against one of said opposing surfaces and spaced away from the other of said surfaces of said chamber while said pusher means deforms said flexible sheet product to thereby guide said sheet as it is deformed; and

means for inserting said deformed sheet product into the container from said chamber.

4,594,835

METHOD FOR MAKING SACHETS

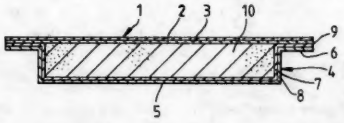
Roy F. Gray, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 287,809, Jul. 28, 1981. This application Sep. 28, 1983, Ser. No. 536,450

Claims priority, application United Kingdom, Aug. 11, 1980, 8026059

Int. Cl.[4] B65B *31/02*

U.S. Cl. 53—433 **4 Claims**



1. A method for making a sachet which comprises forming a dish-like pocket in a sheet of film or foil, placing a measured amount of liquid into the pocket, placing a carrier comprised of compressible porous material into the pocket, absorbing a first part of said measured amount of liquid into said carrier which is placed into said pocket, placing a second film or foil over the pocket which pocket contains the liquid and piece of carrier to form an assembly, evacuating the pocket and around the assembly below atmospheric pressure, sealing the second film or foil around the edge of the pocket to form a sachet, and decreasing the volume of the carrier, compressing the carrier and forcing an additional quantity of liquid into the carrier by releasing the vacuum around the sachet.

4,594,836

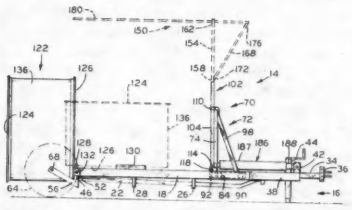
APPARATUS AND METHOD FOR LOADING PLASTIC TUBING WITH BALES

Maynard L. Good, 23257 County Rd., 18 East, Rte. 7, Elkhart, Ind. 46514

Filed Jul. 23, 1984, Ser. No. 633,138

Int. Cl.[4] B65B *9/00*

U.S. Cl. 53—459 **23 Claims**



2. A method for loading bales into plastic tubing, comprising the steps of:

positioning a roll support device having a roll of plastic tubing thereon over a bale guide having opposite open, communicating ends therein;

positioning the bale guide in a first generally vertical position on a transportable base frame, whereby one of the open ends is disposed generally upwardly;

dispensing the plastic tubing from the roll support device over the one open end of the bale guide and inserting the one open end of the bale guide into one end of the plastic tubing;

gathering a predetermined length of the plastic tubing onto an outer surface of the bale guide around the one open end;

retaining the flow of the plastic tubing from the outer surface with a bag retainer;

pivoting the bale guide to a generally horizontal position on the longitudinal axis of a transportable elongated frame;

removing the roll support device;

securely closing the one end of the plastic tubing over the one open end of the bale guide for containing bales;

loading a bale onto the elongated frame facing the other one of the open ends of the bale guide;

engaging the bale with a carriage guided on the elongated frame;

applying force against the carriage for causing the carriage to contact the other one of the open ends of the bale guide; and

guiding the engaged bale from the elongated frame into the plastic tubing.

22. Apparatus for loading bales into plastic tubing comprising:

a transportable base member including:

at least one wheel,

at least one axle rotatively supporting said wheel, and

an elongate frame member mounted on said axle and adapted for sequentially supporting and transferring round bales into plastic tubing, said frame member having a plurality of spaced-apart rails defining the longitudinal axis of said frame member, with at least one of said spaced-apart rails adapted for providing guided longitudinal movement thereon, and at least one cross member having opposite ends with each of said ends being rigidly connected to a respective one of said spaced-apart rails;

a carriage member selectively mounted on said frame member for engaging said supported bale and including:

a bulkhead member having opposite faces,

an upper end portion and a bottom end portion,

means for supporting said bulkhead member in a generally vertical attitude with respect to said frame member,

means connected to said bulkhead member for selectively extending engagement of said carriage member with the bale, and

means for removably mounting said carriage member on said at least one guide rail and for accommodating guided longitudinal movement of one of said carriage member and said frame member relative to the other whereby the engaged bale is urged to load into the plastic tubing;

means selectively mounted on said frame member for guiding the engaged bale into the plastic tubing, means for mounting said bale-guiding means for selective movement between a substantially vertical transport position and a bale-loading position;

means mounted on said frame member and operatively connected to one of said carriage member and said bale-guiding means for moving the connected one of said carriage member and said bale-guiding means in a longitudinal direction relative to the other, whereby the engaged bale is transferred from said frame member into the plastic tubing; and

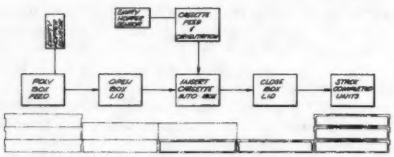
means selectively mounted adjacent said bale-guiding means for dispensing plastic tubing over one of opposite open ends of said bale-guiding means.

4,594,837

CASSETTE PACKING DEVICE AND METHOD

Darrell W. Zielke, 25526 Via Desca, Valencia, Calif. 91355

Filed May 1, 1985, Ser. No. 729,310
Int. Cl.[4] B65B *43/38, 7/26*
U.S. Cl. 53—468 **16 Claims**



1. A cassette packing device for loading cassettes into soft-poly boxes having a lid pivotally coupled to each box and flanges on each end of each lid extending toward the box and being outwardly therefrom, comprising

a guideway sized to receive the soft-poly boxes end to end;

a pusher extending to said guideway to advance the soft-poly boxes along said guideway;

an opener to pivot the lids from engagement with the boxes; and

a lid guide extending over said guideway at said opener to restrict pivotal movement of the lids such that flanges on adjacent lids remain in contact in said guideway.

4,594,838

CAPPING METHOD AND APPARATUS FOR A BEVERAGE VENDOR

Leonard A. Ficken; Gerald J. Podgorny, and James A. Boyle, all of St. Louis County, Mo., assignors to UniDynamics Corporation, Stamford, Conn.

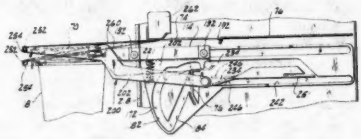
Filed Oct. 12, 1984, Ser. No. 660,105
Int. Cl.[4] B65B *3/04, 7/28*
U.S. Cl. 53—471 **19 Claims**

1. In a beverage vendor having a stationary cup station to which a cup is delivered from a cup supply and means operable upon registration of credit for a vend and selection by a customer to fill the cup at the cup station with a beverage:

means for capping each cup after it has been filled at the cup station with the filled and capped cup retrievable by the customer from the cup station comprising;

means for holding a stack of caps in the vendor spaced from the cup station;

carriage means operable on filling the cup at the cup station for ejecting a cap from the stack and carrying it to and placing it on a filled cup at the cup station and then returning to a position adjacent the means for holding a stack of caps, and



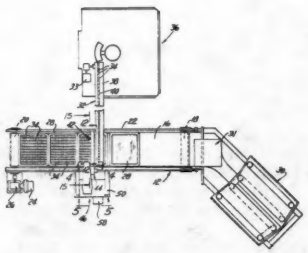
means in the carriage means for pressing the cap down on the cup as the carriage returns to its position adjacent the means for holding a stack of caps.

4,594,839

SAGGER LOADER AND CONVEYOR APPARATUS AND METHOD

Raymond P. DeSantis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Continuation-in-part of Ser. No. 465,166, Feb. 9, 1983, Pat. No. 4,550,551. This application Jul. 16, 1985, Ser. No. 755,676
Int. Cl.[4] B65B *5/10*
U.S. Cl. 53—475 **20 Claims**



1. An apparatus for transferring parts comprising a first conveyor for carrying parts in a single row along a first axis of travel, a second conveyor having a receptacle thereon and traveling along a second axis of travel at an angle to said first axis of travel, said receptacle for carrying parts placed therein in consecutive rows of a predetermined plurality of said parts, a stationary housing disposed at a location where said first axis of travel and said second axis of travel intersect, an elbow-joint arm supported by said housing and pivotable relative to said housing, said elbow-joint arm having a first arm pivotable around a single pivot axis relative to said housing and a second arm mounted on the end of said first arm pivotable around a second pivot axis relative to said first arm, said first and second pivot axes being substantially parallel, a part pick-up member mounted on the end of said second arm, means in said housing for pivoting said first arm relative to said housing and said second arm relative to said first arm for placing said part pick-up member over said parts on said first conveyor for picking up a row of said parts and for pivoting said first arm relative to said housing and said second arm relative to said first arm for placing said part pick-up member over said receptacle on said second conveyor for placing said row of said parts in said receptable, wherein said part pick-up member comprises an elongated body, a chamber in said body, orifice means in a face of said body in communication with said chamber, and conduit means placing said chamber in communication with a source of

suction for picking up a row of parts in engagement with said orifices.

4,594,840

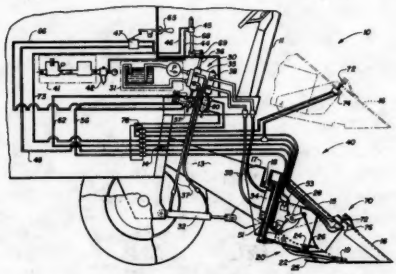
PNEUMATIC SYSTEM FOR COMBINE HEADER HEIGHT CONTROL

Werner K. D'Almeida, and Oldemar Boeck, both of Curitiba, Brazil, assignors to Sperry Corporation, New Holland, Pa.

Division of Ser. No. 560,100, Dec. 12, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 702,774

Int. Cl.[4] A01D *41/06, 75/18*

U.S. Cl. 56—11.2 **3 Claims**



1. In a combine having a mobile frame adapted for movement across a field; a transverse header supported from said frame for movement in a generally vertical direction relative to the ground and said mobile frame, said header being operable to collect crop material from the field and initiate the crop harvesting process, said header being generally vertically movable relative to said frame to follow longitudinal ground contours; sensing means mounted on said header to sense the location of the ground rleative to said header; and header lift means interconnecting said header and said frame to power the generally vertical movement of said header relative to said frame, the improvement comprising:

pneumatic control means operatively connected to said sensing means and to said header lift means to effect the operation of said header lift means to move said header in a generally vertical direction in response to the sensing of a change in the position of the ground relative to said header by said sensing means such that the position of said header relative to said frame is varied to maintain a generally constant positional relationship between the ground and said header; and

means for selectively actuating a movement of said combine in a reverse direction operatively connected to said pneumatic control means such that an actuation of said actuating means causes said pneumatic control means to effect a raising of said header so that said header is raised in response to the selective movement of said combine in a reverse direction.

4,594,841

FORAGE CUTTER OR CHOPPER

Eberhard Wistuba, Rettenbach, and Xaver Lenzer, Kötz, both of Fed. Rep. of Germany, assignors to Karl Mengele & Söhne GmbH & Co., Günzberg, Fed. Rep. of Germany

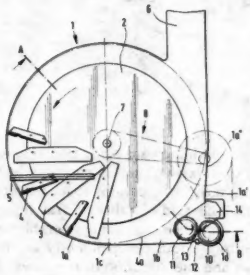
Filed Feb. 21, 1985, Ser. No. 703,707

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406201

Int. Cl.[4] A01D *87/10*

U.S. Cl. 56—13.3 **10 Claims**

1. Forage cutter including a housing, means within said housing for conveying the forage material to be cut, and means within said housing for receiving cut material for crushing the material, wherein the improvement comprises a cutting wheel rotatably mounted within said housing, said housing comprises a pair of laterally spaced side walls located on opposite sides of said cutting wheel and a backing wall extending between said, side walls and extending around the outer circumferential periphery of said cutting wheel, said cutting wheel having knives and blades secured thereto with said knives and blades alternating around said wheel, a fixed cutting plate mounted in said housing and cooperating with said knives for cutting material introduced into said housing, a shaft located within said housing and extending between said side walls, said cutting wheel mounted for rotation on said shaft, said knives and said blades projecting generally radially outwardly from the outer circumferential periphery of said cutting wheel, the radially outer edges of said blades rotating along a circular path within said housing, along a portion of said circular path of said blades said backing wall is spaced closely from the circular path, in the direction of rotation of said cutting wheel



downstream from said cutting plate said backing wall diverges outwardly from said circular path of said blades and forms in combination with said side walls a space for receiving material carried along by said blades from said cutting plate, said crushing means located within said space outwardly from said circular path of said blades for receiving and crushing the cut material, said cutting wheel being vertically arranged with said side walls extending generally vertically, said space being located in a lower part of said housing, above said space said backing wall converges inwardly toward said circular path of said blades, and a material discharge outlet passageway opening through said housing extends outwardly from said housing above the location where said backing wall converges inwardly for receiving the material crushed in said space so that the material can be carried upwardly by said blades along said backing wall into said outlet passageway.

4,594,842

MACHINE FOR HARVESTING AND CHOPPING OF MAIZE OR SIMILAR STALK-TYPE HARVESTS

Norbert Wolters, Gescher; Manfred Steppat, and Alfred Bertling, both of Stadtlohn, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Kemper GmbH, Stadtlohn, Fed. Rep. of Germany

Continuation of Ser. No. 514,202, Jul. 14, 1983, abandoned. This application Jun. 12, 1985, Ser. No. 743,886

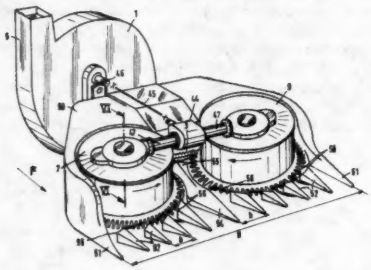
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226876; Mar. 8, 1983, 3308077

Int. Cl.[4] A01D *45/02*

U.S. Cl. 56—94 **22 Claims**

1. A machine for harvesting and chopping up maize or similar stalk-type harvests comprising a chaff-blower, feed rollers for feeding cut stalks to said chaff-blower, spaced guide means for guiding stalks to be cut, and drawing-in and mowing means rotatable about a substantially vertical axis and operable to draw in and mow the stalks of the harvest in the upright position and subsequently deliver the cut stalks to said feed rollers with the cut-off ends of the stalks facing said feed rollers, said spaced guide means being disposed forwardly of said

drawing-in and mowing means for guiding said stalks to said drawing-in and mowing means as the machine is moved forwardly, and spaced guide means comprising two outer guide elements disposed laterally outwardly of said drawing-in and mowing means, said two outer guide elements having forward extending end portions which are spaced from one another by a distance which defines the cutting width of the machine, said



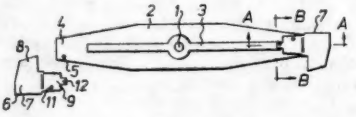
drawing-in and mowing means being operable to drawn in and cut a plurality of stalks within said cutting width at a plurality of drawn-in and mowing locations spaced laterally across the front of the machine, said plurality of drawing-in and mowing locations and said guide means being operable to harvest crops within said cutting width independently of the distance between the rows and the direction of the rows of said stalks to be harvested.

4,594,843

LAWN MOWER KNIFE ASSEMBLY

Roger Andersson, Grönna; Lennart Engdahl, and Jan Klasson, both of Tranås, all of Sweden, assignors to Stiga AB, Tranas, Sweden

Filed Sep. 5, 1984, Ser. No. 647,516
Claims priority, application Sweden, Sep. 9, 1983, 8304839
Int. Cl.[4] A01D *55/18*
U.S. Cl. 56—295 **4 Claims**



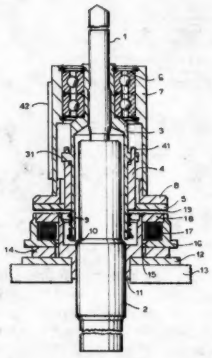
1. A lawn mower knife assembly including a rigid member (2) attached to a generally vertical motor-driven shaft (1), said rigid member being provided, at a distance from the shaft attachment, with at least two attachment points for knife means, and at least two knife means (6), each including a blade section provided with a cutting edge (7), and a shank portion (9) adapted for the fixation of the knife means to the rigid member wherein each of the attachment points comprises a flat surface section (4) in which there is made a through-hole (5) for a fastener and a recess (3) arranged beyond the hole, the shank portion (9) of each knife means including a flat surface section (10) with a through-hole (11) and a projection (12) provided adjacent said flat surface section (10) of the shank portion, said projection extending away from the plane of the flat surface section of the shank portion, while the surface sections (4, 10) of the attachment point and the shank portion are adapted, when in mounted condition, to lie in contact with each other with the holes (5, 11) aligned, and the projection (12) is accommodated in the recess to deter rotation of the knife about said fastener; said projection and recess constituting a yieldable rotary latch means wherein, when the knife is subjected to a predetermined twisting moment, the entire projection snaps out of the recess and rotates with the knife about said fastener.

4,594,844

STOP SPINDLE FOR TEXTILE MACHINES

Cyril Muzila, Nitra-Chrenová , Czechoslovakia, assignor to Elitex, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Continuation-in-part of Ser. No. 554,253, Nov. 22, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 727,536
Claims priority, application Czechoslovakia, Nov. 24, 1982, 8396-82
Int. Cl.[4] D01H *7/22*
U.S. Cl. 57—88 **4 Claims**



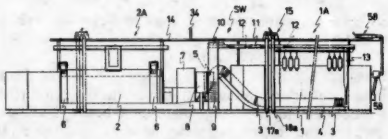
1. A stop spindle for textile machines, particularly spinning and twisting machines, said spindle having a whirl and a brake lining, comprising a ferromagnetic clutch element which is axially displaceable between the whirl and the brake lining, on the axially opposite side of the brake lining from the whirl there being mounted an electromagnet, the brake lining being made of non-magnetic material, a permanent magnet having radially spaced pole shoes disposed on radially inwardly and outwardly, respectively, sides of the brake lining, means selectively to energize the electromagnet so as to create a magnetic field which is additive with respect to the magnetic field of the permanent magnet, whereby to start the driving of the spindle, and selectively to energize the electromagnet so as to create a magnetic field which is subtractive with respect to the magnetic field of the permanent magnet, whereby to stop the driving of the spindle and to brake it.

4,594,845

FLY REMOVING SYSTEM FOR SPINNING WINDER

Isamu Matsui, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Jul. 10, 1984, Ser. No. 629,264
Claims priority, application Japan, Jul. 11, 1983, 58-126481
Int. Cl.[4] D01H *11/00, 15/00*
U.S. Cl. 57—304 **12 Claims**



1. In a spinning winder in which a spinning frame and a

winder are connected by way of a spinning bobbin passage and/or an empty bobbin passage,

a fly removing system characterized: in that the fly removing system includes a ceiling rail extending in the longitudinal direction between a spinner area and a winder area, and a cleaner which is then placed along the rail and is made reciprocally movable, said cleaner comprising a blower, and a plurality of ducts which have openings at the blower and have air injection ports and/or air suction ports formed therein at positions within said ducts which are adjacent to those portions of said spinner area where said flies are located.

4,594,846

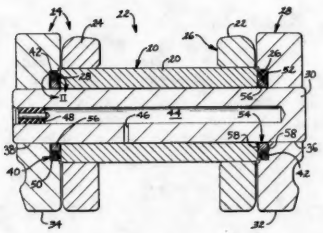
TRACK JOINT AND METHOD OF ASSEMBLING SAME

Richard E. Livesay, and Charles E. Grawey, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 615,629, May 31, 1984, abandoned. This application May 16, 1985, Ser. No. 734,216

Int. Cl.[4] B21L *9/00*

U.S. Cl. 59—5 **10 Claims**



1. A method of providing a controlled running clearance between opposing thrust surfaces of a track joint, the joint having a first member pivotable relative to a second member thereof, comprising the steps of:

applying a controlled interstice producing membrane to at least one of the thrust surfaces of the joint, said membrane having a thickness of between 0.001 to 0.010 inches;

assembling said joint by exerting an axial compressive force sufficient to compressively load said membrane between said members; and

grinding said membrane into fine particles upon initial pivotal movements of said joint after assembly and providing a controlled narrow interstice between said thrust surfaces sufficient to axially unlock the joint and allow substantially free pivotal movement of the joint thereafter.

4,594,847

DETACHABLY INTERCONNECTABLE CHAIN LINK AND CHAIN CONSTRUCTED THEREWITH

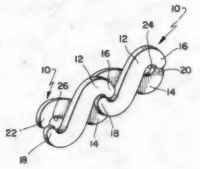
Kurt Klier, and Heinz Klier, both of Kaufbeuren-Neugablonz, Fed. Rep. of Germany, assignors to E.H. Ashley & Company, Inc., Providence, R.I.

Filed Aug. 20, 1984, Ser. No. 642,372

Int. Cl.[4] F16G *13/06*

U.S. Cl. 59—85 **5 Claims**

1. A detachably interconnectable chain link comprising a pair of substantially S-shaped link elements rigidly connected to each other at their central portions in crossing relation to define a link of substantially figure-8-shaped configuration having first and second substantially closed loops at opposite extremities thereof, said link elements each having first and second terminal end portions which are disposed in said first and second loops, respectively, and terminate in first and second terminal ends, respectively, said first terminal ends in said first loop being laterally offset with respect to each other, being substantially aligned in the same direction in which they are offset, and being spaced in substantially the same direction in which they are offset by an amount which is less than the thickness of either of said first terminal end portions but being resiliently separable in substantially the same direction in which they are offset for snap receiving a loop of similar configuration of another link therebetween, said second terminal ends in said second loop being laterally offset with respect to



each other, being substantially aligned in the same direction in which they are offset, and being spaced in substantially the same direction in which they are offset by an amount which is less than the thickness of either of said second terminal end portions, but being resiliently separable in substantially the same direction in which they are offset for snap receiving a loop of similar configuration of another link therebetween.

4,594,848

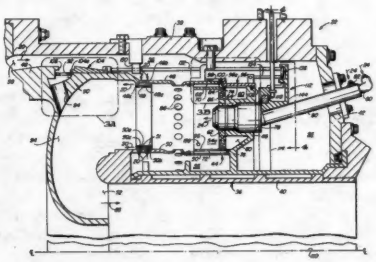
GAS TURBINE COMBUSTOR OPERATING METHOD

Hukam C. Mongia; Edwin B. Coleman, both of Tempe, and Thomas W. Bruce, Phoenix, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 400,580, Jul. 22, 1982. This application Jun. 13, 1984, Ser. No. 620,342

Int. Cl.[4] F02C *7/00, 7/277*

U.S. Cl. 60—39.02 **3 Claims**



1. A method of operating a combustor comprising the steps of:

(a) flowing pressurized air from a source thereof into a liner portion of said combustor through an inlet opening formed in said liner portion;

(b) utilizing a first portion of the pressurized air entering said liner portion to cool an interior surface portion of said liner portion;

(c) utilizing a second portion of the pressurized air entering said liner portion as combustion air within said liner portion;

(d) mixing said combustion air with fuel and burning the fuel-air mixture within said liner portion; and

(e) simultaneously controlling the cooling of said interior surface portion and the richness of said fuel-air mixture by selectively varying the air inflow through said inlet opening,

said step (a) being performed by flowing pressurized air into an upstream end portion of said liner portion, and said method comprising the further steps of forming in said liner portion an additional air inlet opening spaced in a

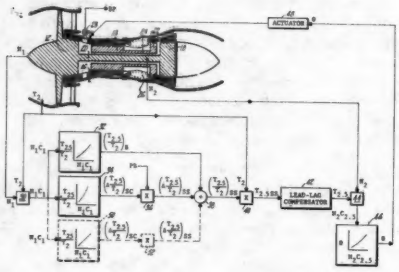
downstream direction from said first-mentioned inlet opening for receiving pressurized air from a source thereof, and varying the air inflow through said additional inlet opening in generally inverse proportion to the air inflow variance through said first-mentioned inlet opening.

4,594,849

APPARATUS FOR SYNTHESIZING CONTROL PARAMETERS

David F. Kenison, Glastonbury, and Donald E. Sheppard, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1984, Ser. No. 683,904
Int. Cl.[4] F02C 9/20
U.S. Cl. 60—39.29 **7 Claims**



1. Apparatus for synthesizing a control parameter for use in a gas turbine engine, comprising:

first function generator means responsive to an engine operating parameter for generating a first signal simulating the value of a control parameter for the engine operating in a preselected base configuration;

second function generator means responsive to an engine operating parameter for generating a second signal simulating the difference between the value of said control parameter for the base engine configuration and the value of said control parameter for a second preselected engine operating configuration different from said base configuration;

means for operating on said second signal to produce a third signal simulating said difference in values for the actual engine operating configuration; and

means for summing said first and third signals to produce a fourth signal simulating said control parameter for said actual engine operating configuration.

4,594,850

COMBINED CYCLE TOTAL ENERGY SYSTEM

John R. Joy, Brighton, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Feb. 7, 1983, Ser. No. 464,196
Int. Cl.[4] F02C 7/26
U.S. Cl. 60—39.141 **1 Claim**

1. A system for the co-generation of steam and electricity comprising:

a source of gaseous fuel,

a source of air,

means for mixing said fuel and air to form a relatively lean fuel/air mixture,

a gas turbine,

a first fuel/air mixture compressor directly driven by said turbine,

a second fuel/air mixture compressor driven by said turbine for further compressing said fuel/air mixture,

a catalytic burner between said second compressor and gas turbine,

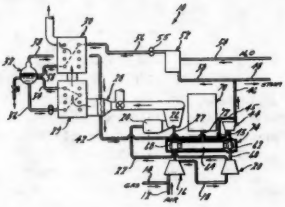
a motor/generator,

a steam turbine,

means coupling said gas turbine, motor/generator, first and second compressors and steam turbine to one another,

a source of water,

a steam boiler connected to said source of water and to the exhaust system of said gas turbine,



a steam economizer connected to said boiler,

a steam superheater in heat exchange relationship with the exhaust system of said gas turbine disposed between said economizer and said steam turbine, and

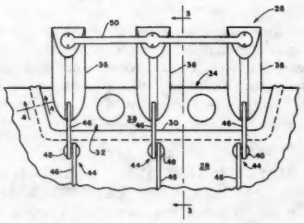
controllable means for bypassing superheated steam from said superheater around said steam turbine to maximize steam or electric power output of said system, selectively.

4,594,851

FLAMEHOLDER WITH REMOVABLE FLAMEHOLDER ATTACHMENTS

Steven B. Kushnick, Palm Beach Gardens, and Gunther Eichhorn, Jupiter, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 562,263, Dec. 16, 1983, abandoned.
This application Apr. 18, 1985, Ser. No. 724,720
Int. Cl.[4] F02C 1/00
U.S. Cl. 60—261 **6 Claims**



1. An improved flameholder structure for the afterburner of a gas turbine engine, comprising:

a. an annular shroud defined within said afterburner, said shroud including a trailing edge defining a plurality of peripheral openings therein;

b. a plurality of flameholder attachments supported entirely by said shroud, one of said flameholder attachments mounted within each peripheral opening, each of said flameholder attachments including a support plate for removably mounting said flameholder attachments within said peripheral openings, at least one radially extending flameholding element mounted on each support plate, said trailing edge of said shroud at each peripheral opening having a continuous channel defined therein, said channel having a shape complementary to a leading edge of said

support plate, said channel and leading edge of said support plate together defining a slip joint means for fixedly connecting said flameholder attachments to said shroud; and

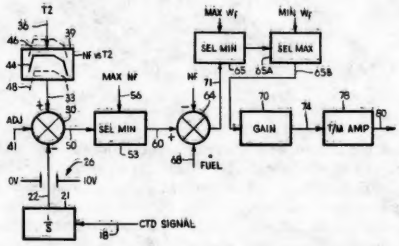
c. brace means connecting said at least one radially extending flameholding element to said shroud for holding the flameholding element on said support plate.

4,594,672

AIRCRAFT ENGINE CONTROL

Barton H. Snow, Wyoming, and William W. Stockton, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 30, 1984, Ser. No. 666,535
Int. Cl.[4] F02C *9/28*
U.S. Cl. 60—38.281 6 Claims



1. In a fuel control system in an aircraft which includes means (64) for comparing a presently demanded speed signal with an actual speed signal of a component of the engine, the improvement comprising:

(a) scheduling means for generating a signal indicative of a maximum allowable speed (MAX Nf) of the engine component as a function of the temperature (T2) of a predetermined, other engine component;

(b) means for modifying the MAX Nf signal as a function of a Conditioned Thrust Demand (CTD) signal, which is a signal indicative of a deviation of an aspect of aircraft performance from a predetermined reference, in order to produce the presently demanded speed signal, the means including

(i) an integrator for receiving the CTD signal and integrating the signal received, and

(ii) switching means for selectively removing the influence of the CTD signal from the scheduling means.

4,594,853

WAVE POWERED GENERATOR

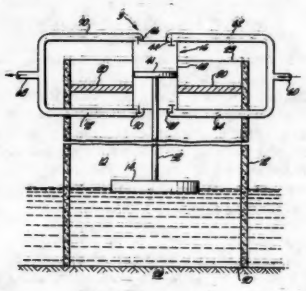
Fredric Raichlen, San Marino, and Jiin-Jen Lee, Sierra Madre, both of Calif., assignors to Wave Power Industries, Arcadia, Calif.

Filed Mar. 12, 1984, Ser. No. 588,916
Int. Cl.[4] F03B *13/12*
U.S. Cl. 60—502 41 Claims

1. An apparatus for generating power from the wave motion of the ocean comprising:

(a) a resonant chamber in the ocean, the chamber having an exterior substantially vertical wall substantially perpendicular to the plane of the water with an opening therethrough, the opening generally facing the direction of wave propagation for passage of water into and out of the chamber, the chamber amplifying the wave motion of the body of water in the fundamental mode so that the amplitude of waves in the chamber is greater than the amplitude of the waves passing into the chamber, the chamber being sized so that the equivalent diameter of the chamber is from 0.15L/pi to L/pi where L is the length between the crest of waves passing into the chamber;

(b) a float in the chamber, the float moving up and down in response to the wave motion in the chamber; and



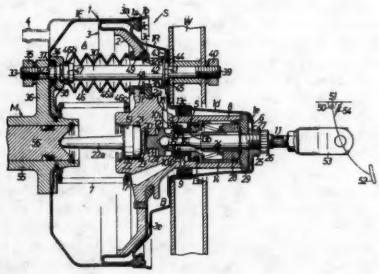
(c) power generating means operatively connected to the float for converting the kinetic energy of the float to useful energy.

4,594,854

ASSEMBLY OF VACUUM BOOSTER AND MASTER CYLINDER

Hiroo Takeuchi, Asashina; Nobuaki Hachiro, and Yoshihisa Miyazaki, both of Ueda, all of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Continuation of Ser. No. 511,974, Jul. 8, 1983, abandoned, which is a continuation of Ser. No. 269,966, Jun. 3, 1981, abandoned. This application Mar. 15, 1985, Ser. No. 712,463
Claims priority, application Japan, Dec. 6, 1980, 55-172479; Dec. 10, 1980, 55-176867[U]
Int. Cl.[4] B60T *13/00*
U.S. Cl. 60—547.1 2 Claims



1. In a assembly of a vacuum booster device and a master cylinder comprising a booster shell divided into a front bowl and rear bowl, a booster piston and a piston diaphragm accommodated in the booster shell, said piston diaphragm being fixed at its inner peripheral edge to said booster piston and at its outer peripheral edge being held between opposite edge portions of said front and rear bowls, a return spring arranged between said front bowl and said booster piston, a cylinder body provided on the front surface of said front bowl, and a working piston slidably fitted in said cylinder body and operatively associated with said booster piston; the improvement wherein said cylinder body includes a mounting flange adjacent said front surface of said front bowl; said front and rear bowls and mounting flange are connected together by tie rods extending through said booster piston so that any means for fastening said opposite edge portions of both of said front and rear bowls is eliminated; said tie rods extend through both of said bowls, said booster piston and said mounting flange, ne end of each said tie rod being fixedly fastened to said rear bowl

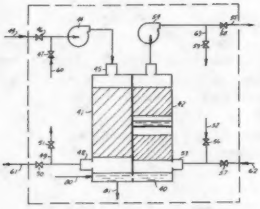
while the other end thereof being tightened against said mounting flange and said front bowl with a nut screwed on said tie rod and a snap ring of thin sheet material is clipped into a reduced diameter portion of said tie rod and is opposed to the front face of said front bowl to retain said front and rear bowls assembled when said nut and said mounting flange are removed from said tie rod, said snap ring being housed in an annular recess surrounding said tie rod and in the surface of said mounting flange when said mounting flange is abutted on the front face of said front bowl by said nut so as to cause no interferences between the surfaces of said mounting flange and said front bowl when said mounting flange and said front bowl are assembled and being exposed on the front face of said bowl for removal from said tie rod when said nut and said flange are removed from said tie rod.

4,594,855

PROCESS AND APPARATUS FOR VENTILATION WITH HEAT EXCHANGE

Arnold Gunther, 29 Lorelei Rd., West Orange, N.J. 07052

Filed Apr. 24, 1985, Ser. No. 726,850
Int. Cl.[4] F25D *17/06*
U.S. Cl. 62—92 **4 Claims**



1. A process for ventilating indoors spaces, during the hot season, consisting of: passing a stream of outdoors air through a heat exchanger of the plate-fin type, passing a like stream of indoors air through said heat exchanger, said outdoors air having a higher temperature and humidity than said indoors air, said outdoors and indoors air streams flowing vertically and countercurrently in adjacent passages of said heat exchanger, transferring heat across said adjacent passages, from the outdoors air stream to the indoors air stream, cooling said outdoors air stream, condensing water vapor from the outdoors air stream into a first water film, said film wetting a substantial portion of the surface of the passages occupied by said outdoors air stream, said first water film flowing cocurrently to said outdoors air stream, causing a second water film to flow and wet a substantial portion of the surface of the passages occupied by said indoors air stream, said second water film and the indoors air stream flowing in countercurrent relationship, heating the indoors air stream, evaporating water vapor from a portion of said second water film into said indoors air stream, collecting and joining said first flowing film with the remaining liquid portion of said second flowing film, returning the collected water to the top of the passages occupied by the indoors air stream, transferring said cooled and dehumidified outdoors air stream from the heat exchanger to the indoors space, transferring said heated and humidified indoors air stream from the heat exchanger to the outdoors.

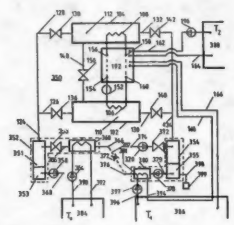
4,594,856

METHOD AND DEVICE FOR PUMPING HEAT

Markus Rothmeyer, Gleiwitzer Str. 28, 8058 Erding, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,847
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—112 **26 Claims**

1. A method of increasing the temperature of heat using a working fluid which is desorbed at a working fluid pressure p_1 from a solid adsorbent contained in at least one adsorber/generator while supplying heat at a high temperature T_2, where said working fluid is transformed from the vapor to a liquid phase at an intermediate temperature T_1 while liberating heat, where the liquid phase of said working fluid is transformed to a gaseous phase at low working fluid pressure p_0 while taking up heat at a low temperature T_0, where said gaseous working fluid is adsorbed and liberates heat in at least one further adsorber/generator containing said solid adsorbent, and where the process is continued by alternately desorbing and adsorbing in the two or more adsorber/generators, comprising; an internal



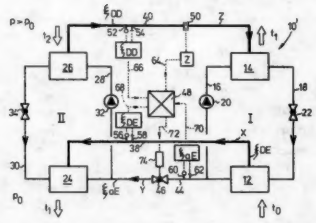
heat exchange step used before changing from the adsorption to the desorption phase in the adsorber/generators which includes first a pressure equalization steip between at least one of the adsorber/generators at a higfher working fluid pressure and temperature and one or more other adsorber/generators being at a lower working fluid pressure and temperature and subsequently a heat transfer step from at least one of the adsorber/generators being at higher temperature with higher working fluid concentration to at least one of the adsorber/generators being at a lower temperature at a lower working fluid concentration.

4,594,857

RESORPTION-TYPE THERMAL CONVERSION APPARATUS

Vinko Mucic, Walldorf, Fed. Rep. of Germany, assignor to TCH Thermo-Consulting-Heidelberg GmbH, Heidelberg, Fed. Rep. of Germany

PCT No. PCT/EP84/00388, § 371 Date Aug. 9, 1985, § 102(e) Date Aug. 9, 1985, PCT Pub. No. WO85/02669, PCT Pub. Date Jun. 20, 1985
PCT Filed Dec. 5, 1984, Ser. No. 768,115
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344599
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—141 **3 Claims**



1. Resorption-type thermal conversion apparatus, such as a heat pump, refrigeration machine or heat transformer, which is operated with a binary working medium, especially a mixture of ammonia and water, in order to raise to a higher temperature level the thermal energy supplied from an external thermal energy source, the apparatus having two solvent circuits in

which the working medium in liquid phase is brought from a lower to a higher pressure level and is expanded again to the lower pressure level, and between the two circuits, both on the low-pressure and on the high-pressure side, an interconnecting conduit exists in which working medium that is in the vapor phase passes over, characterized in that, in the interconnecting conduit (**40**; **38**; **108**; **106**) on the high-pressure and low-pressure sides, a pressure sensor and a temperature sensor (**52**, **54**; **56**, **58**) are provided in each, whose data are combined to form a measure of the concentration of the lower-boiling, vaporous component of the binary working medium with respect to the total vaporous volume of the working medium, that in one of the two interconnecting conduits a volumeter (**50**) is provided for the volume of the vaporous working medium flowing through it, and a balancing conduit (**44**; **112**) is provided parallel to the interconnecting lines for flowing liquid working medium of different concentration, a pressure measuring sensor and a temperature measuring sensor (**60**; **62**) being also provided in the compensating conduit for determining the concentration of the liquid working medium flowing therein, and additionally a remotely operated control valve (**46**; **116**), and that a central computer unit (**48**; **114**) connected to the measuring sensors and the volumeter is provided, in which the signals proportional to the measured value delivered through the signal lines are continuously processed and converted to an actuating signal for the opening or closing of the control valve (**46**; **116**) disposed in the compensating conduit (**44**; **112**), and which controls the aperture of the control valve (**46**; **116**) such that the volumetric difference of the vaporous working medium flowing between the two circuits (I; II) is compensated.

4,594,858

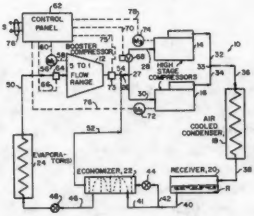
HIGHLY EFFICIENT FLEXIBLE TWO-STAGE REFRIGERATION SYSTEM

David N. Shaw, Unionville, Conn., assignor to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 569,886, Jan. 11, 1984, abandoned. This application Jul. 30, 1984, Ser. No. 636,068

Int. Cl.[4] F25B *1/10*

U.S. Cl. 62—175 **16 Claims**



1. A refrigeration circuit comprising:

a first stage compressor,

at least two second stage compressors,

a condenser,

an economizer,

an evaporator,

conduit means bearing a compressible refrigerant connecting said first stage compressors, said second stage compressors as a group, said condenser, said economizer, and said evaporator, in series in a closed loop in that order, said second stage compressors being in parallel with each other,

said conduit means further comprising means for bleeding a portion of the condensed refrigerant from said closed loop downstream of said condenser and expanding it within said economizer for subcooling liquid refrigerant fed by said closed loop to said evaporator and for returning expanded refrigerant at relatively high pressure from said economizer to an inter-stage point between the outlet of the first stage compressor and the inlet of said second stage compressors,

motors for driving said compressors, and

means for controlling operation of said first and second stage compressors including means for selectively driving said second stage compressor motors and for selectively controlling refrigerant flow to and from said second stage compressors,

said first stage compressor motor is a variable speed motor,

said second stage compressors are fixed capacity compressors,

said control means comprises first sensing means for sensing a condition of said system upstream of said first stage compressor, second sensing means for sensing an inter-stage refrigerant condition, and means responsive thereto for initially varying the speed of operation of said first stage compressor and secondly for shutting down said second stage compressors, in order, when said inter-stage condition reaches a predetermined minimum, such that said booster first stage compressor is always operating, and the economizer is always active, and

said second stage compressors insuring that the inter-stage condition variation is maintained within a desired range.

4,594,859

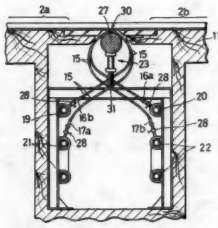
ICE SKATING RINK

Kazuo Ohashi, Tokyo, Japan, assignor to Kabushiki Kaisha Patine Shokai, Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,080

Int. Cl.[4] A63C *19/10*

U.S. Cl. 62—235 **7 Claims**



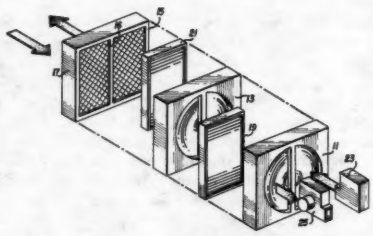
1. An ice skating rink comprising a multiplicity of freezing pipes arranged on a rink floor and extending in the longitudinal direction of the freezing area of the rink, said pipes having one ends connected to refrigerant supply header means and the other ends connected to refrigerant return header means and the freezing medium circulating through a freezing system including these pipes and the supply and return header means for forming an ice layer on the rink floor, characterized in that the freezing area of the rink is divided into plural spans by recesses extending in the widthwise direction of the freezing area, said freezing pipes are arranged on floor sections associated with the respective spans, said refrigerant supply and return headers and fixture means for supporting the freezing pipes are mounted in said recesses for extending widthwise of the freezing area, the freezing pipes associated with any two adjacent spans disposed on either side of the recesses are placed over said fixture means so as to cross one another, and the one ends of the respective freezing pipes are connected to said refrigerant supply header means, while the other ends of the pipes are connected to said refrigerant return header means.

4,594,860

OPEN CYCLE DESICCANT AIR-CONDITIONING SYSTEM AND COMPONENTS THEREOF

James A. Coellner; David S. MacIntosh, and Mark C. Blanpied, all of Waco, Tex., assignors to American Solar King Corporation, Waco, Tex.

Filed Sep. 24, 1984, Ser. No. 653,792
Int. Cl.[4] F25D *23/00*
U.S. Cl. 62—271 36 Claims



1. In an open-cycle air-conditioning apparatus including a rotatable heat exchanger wheel, a rotatable desiccant carrying moisture transfer wheel, evaporator means, heating means disposed between said heat exchanger wheel and moisture transfer wheel, and means for passing air through said heat exchanger wheel and said moisture transfer wheel in an intake/exhaust path, the improvement in said moisture transfer wheel comprising

a hub and shaft assembly;

alternate layers of rigid material and absorbent material wound about said hub and shaft so as to form a wheel of a predetermined diameter and width;

means between said alternate layers for forming axial passages across said wheel;

a semi-rigid rim secured about the circumference of said wheel;

a plurality of rigid spokes secured to said hub and passing radially through said alternate layers and said rim for structurally strengthening said wheel; and

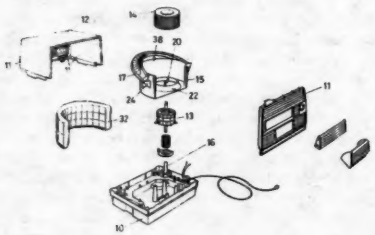
adjustable means on said spokes bearing against the exterior of said rim for truing said wheel.

4,594,861

FAN VOLUTE AND SPREADER

Anthony D. Kearney, St. Marys, Australia, assignor to Coolair Corporation PTE., Ltd., Singapore

Filed May 18, 1984, Ser. No. 612,037
Claims priority, application Australia, May 18, 1983, PF9416
Int. Cl.[4] F28D *5/00*
U.S. Cl. 62—304 6 Claims



1. In an air cooler of the evaporative type having a centifugal type fan, an absorptive pad, and a water spreader which spreads a stream of water into a film which is discharged into the absorptive pad;

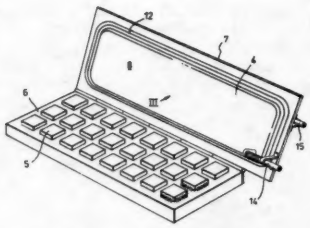
a combination fan volute and spreader, one of which comprises a shelf which engages the other and thereby locates and supports the spreader from the volute, the spreader being of curved shape and outstanding from the outer surface of the volute, and link means hinging the spreader to the volute; said volute including a casing having an upper edge and the volute, spreader and link means all being one monolithic moulding of polymeric material, said shelf comprising a radially inwardly directed flange extending at least part way around the spreader and supported by said upper edge of said volute casing.

4,594,862

HEAT TRANSFER ARRANGEMENT

Diana M. Hodgins, and George J. R. Homewood, both of Stevenage, England, assignors to British Aerospace Public Limited Company, London, England

Continuation-in-part of Ser. No. 596,155, Apr. 2, 1984, abandoned. This application Jan. 3, 1985, Ser. No. 689,015
Claims priority, application United Kingdom, Jan. 21, 1984, 8401625; Feb. 10, 1984, 8403581; Apr. 26, 1984, 8410670
Int. Cl.[4] F25D *17/04*
U.S. Cl. 62—417 11 Claims

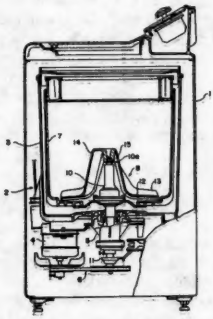


1. A cooling arrangement for electronic components mounted in a structure in which access to the components is gained by moving one part of the structure with reference to another, for example in a racking system, the cooling arrangement being adapted to allow such access without disassembly, including surface means on one part of the structure and movable chamber means on the other part, the movable chamber means having wall means which, in use, lie in heat transfer association with said surface means, second wall means in closely spaced relationship with said first wall means, inlet and outlet means by which a fluid heat transfer medium can flow into and out of the movable chamber means, the disposition of the two wall means being such that a flowing sheet of the heat transfer medium lies against the first wall means in use, and urging means urging said chamber means from a position in which its first wall means are spaced from said surface means to the position in which its first wall means are in heat transfer association with said surface means, said urging means comprising chamber means having inlet means through which heat transfer medium is admitted to effect expansion of said expandable chamber means, flow connection means connecting the inlet means to said movable chamber means, through which the heat transfer medium can flow from the expandable chamber means into the movable chamber means, and outlet means for directing heat transfer medium flow from said movable chamber means without mixing flow in the expandable chamber means.

4,594,863
WASHING MACHINE

Susumu Oida, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 5, 1983, Ser. No. 557,970
Claims priority, application Japan, Dec. 29, 1982, 57-232594
Int. Cl.[4] D06F *13/02, 17/10*
U.S. Cl. 68—133 7 Claims



1. A washing machine comprising:

tub means defining an interior area for holding liquid in upper and lower regions therein;

a pulsator rotatably mounted relative to said tub means and disposed in said interior area thereof, said pulsator including a skirt area having a raised central portion extending to a predetermined upper limit and defining a central axis of rotation, said upper limit together with said skirt area being disposed within said lower region of liquid in said tub means, plural vane means each having an upper end terminating at said upper limit and radially extending from said upper limit to the periphery of said skirt to establish vortex flow within said liquid in said upper and lower regions, and means fixed to said skirt for enhancing the agitation of said liquid in said tub means,

said agitation enhancing means having a projection portion vertically extending higher than said upper limit of said raised central portion so as to vertically extend above said upper end of said raised central portion and thus above said plural vane means,

said projection portion defining an upper substantially planar surface having an opposing pair of smoothly rounded ends and an opposing pair of parallel sides, said ends and sides together defining a perimetrical edge of said upper substantially planar suffface as viewed in plan, said upper surface by virtue of said vertical extension above said upper limit being disposed within said upper region of liquid in said tub means,

said projection portion also defining side walls interconnecting said perimetrical edge of said upper surface and said upper end of each said plural vane means,

said upper surface being eccentrically oriented relative to said central rotational axis to establish a first dimension L_1 from said central rotational axis to one of said pair of rounded ends of said upper surface and a second dimension L_2 from said central rotational axis to the other of said rounded ends of said upper surface, wherein L_1 is greater than L_2 so as to establish an eccentricity ratio L_1/L_2; and

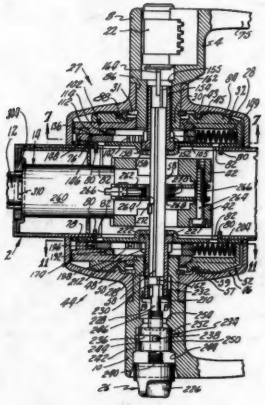
drive means connected to said pulsator for rotating said pulsator in predetermined forward and reverse cycles about said central rotational axis,

said agitation enhancing means, in response to eccentric rotation thereof about said central rotational axis upon rotation of said pulsator by said drive means, for (i) establishing localized areas of highly turbulent flow within said vortex flow so that fabric articles will be randomly turbulently manipulated when encountering said turbulent flow and (ii) creating a force generally opposite said direction of vortex flow in said upper region of said liquid in said tub means when said agitator enhancing means comes into contact with said fabric articles to responsively compress said fabric articles so as to facilitate the cleansing thereof.

4,594,864
LOCKSET ASSEMBLY

Leroy Hart, Farmington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 30, 1983, Ser. No. 537,896
Int. Cl.[4] E05B *55/06*
U.S. Cl. 70—143 18 Claims



1. A lockset for a door comprising a latch bolt assembly including a bolt movable between a partially extended latching position, a fully extended dead bolt position, and a retracted position, a spindle extending through said latch assembly in a direction transverse of the direction of movement of said bolt, means connecting said spindle to said bolt for moving said bolt between its positions upon rotation of said spindle, and an operating assembly comprising a hand operator having locking means therein, a first plate mounted for linear movement in a direction transverse to the axis of said spindle, an actuating member connected to said hand operator for moving said first plate, a second plate having linear movement transverse to the axis of said spindle and adapted to be moved by said first plate, and rotatable drive means attached to said spindle and adapted to be rotated by said second plate.

4,594,865
SEQUENTIAL KEYLESS LOCK

Louise E. Parcell, 5102 SW. 131 Ave., Miami, Fla. 33175

Filed Dec. 6, 1984, Ser. No. 678,748
Int. Cl.[4] E05B *37/00*
U.S. Cl. 70—313 4 Claims

1. A keyless lock for releasably securing two members comprising a casing adapted for mounting on one of said members,

a pair of spaced platforms disposed within said casing and adapted for movement relative to each other

a spring mounted between facing portions of said platforms and urging said platforms away from each other,

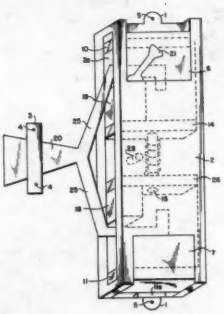
an elongate pin secured to one of said platforms and extending toward said other platform,

an opening passing through said other platform and adapted to receive said pin therethrough when said platforms are urged toward each other,

blocking means affixed to each non-facing surface of said platforms,

a clip adapted to be slidably affixed to said other member for movement in a direction substantially perpendicular to said casing, said clip having a pair of laterally extending arms, each terminating in an L-shaped hook,

said L-shaped hooks extending within said casing through openings in said casing when said two members are se-



cured, said L-shaped hooks being prevented from being withdrawn from said casing by the hooks coming into contact with said blocking means when said spring urges said platforms away from each other,

one of said L-shaped hooks having a notch along one edge spaced from its hook portion,

and a bolt removably mounted within said casing and extending through said notch to prevent lateral withdrawal of said L-shaped hook from said casing.

4,594,866

LOCK CYLINDER WITH A PIVOTABLE CLOSURE

Guy Neyret, Oullins, France, assignor to Neiman S.A., Courbevoie, France

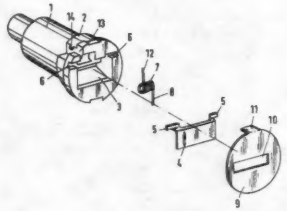
PCT No. PCT/EP82/00240, § 371 Date Jun. 30, 1983, § 102(e) Date Jun. 30, 1983, PCT Pub. No. WO83/01808, PCT Pub. Date May 26, 1983

Continuation of Ser. No. 518,301, Jun. 30, 1983, abandoned. This PCT application Nov. 6, 1982, Ser. No. 750,977

Claims priority, application France, Nov. 12, 1981, 81 21348

Int. Cl.[4] E05B *17/18*

U.S. Cl. 70—455 **1 Claim**



1. A lock cylinder comprising:

a lock cylinder body formed with a passage adapted to receive a key, a head at one end of said body, a rectangular recess provided in an end of said head in line with said passage and having a pair of extensions along one edge of said recess, and a slot formed axially in said head and communicating with said edge between the interior of said recess and the exterior of said head along the outer periphery thereof;

a torsion spring received in said recess and having one leg received in said slot and projecting outwardly from said head therethrough, and another leg lying within said recesss;

a rectangular flap received in said recess and having a pair of lugs projecting into said extensions for pivotally mounting said flap in said recess whereby said other leg lies along an inner surface of said flap;

a cover plate affixed on said head, registering with and covering only said end, overlying said recess and said flap, and having a window aligned with said passage so that insertion of a key through said window deflects said flap inwardly against the force of said spring said cover plate being affixed to said head by a tab bent over said head; and

a circumferentially projecting hook formation provided on said head adjacent said slot, said one leg having an axially bent end exposed along said periphery underlying said formation and braced thereagainst to stress said spring whereby said spring can be stressed only after it has been affixed on said head to cover said spring by the bending of said one leg beneath said formation.

4,594,867

SHEET BENDING MACHINE

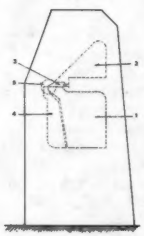
Jorgen S. Andersen, Uldum, Denmark, assignor to Maskinfabriken Cidan A/S, Uldum, Denmark

Filed Sep. 19, 1983, Ser. No. 533,441

Claims priority, application Denmark, Oct. 11, 1982, 4483/82

Int. Cl.[4] B21D *5/04*

U.S. Cl. 72—7 **5 Claims**



1. A sheet bending machine for bending a sheet of material comprising:

a lower beam for supporting a sheet of material;

a clamping beam operatively positioned adjacent to said lower beam for clamping said sheet of material onto said lower beam;

an interchangeable folding rail being operatively affixed to said clamping beam defining a predetermined shape;

a bending beam movably mounted relative to said lower beam, clamping beam and said interchangeable folding rail for imparting movement to a sheet of material clamped between said lower beam and said clamping beam for bending said sheet of material over the interchangeable folding rail;

drive means for imparting movement to said bending beam; and

control means for controlling the extent of movement imparted by the drive means to the bending beam;

said control means includes a steering circuit operatively connected to said bending beam and said interchangeable folding rail and switch means actuated by the movement of said bending beam and a selection of an interchangeable folding rail, said selected folding rail having means thereon for coding said steering circuit and establishing the extent of movement of said bending beam imparted by said drive means wherein a selected interchangeable folding rail will limit the extent of movement imparted by said drive means to said bending beam to correspond to a required movement for bending a sheet of material over

the predetermined shape of said interchangeable folding rail for preventing damage to said sheet bending machine.

4,594,868

SYSTEM AND PLATE BENDING MACHINE FOR REGISTERING IN AN OFFSET PRINTING PRESS

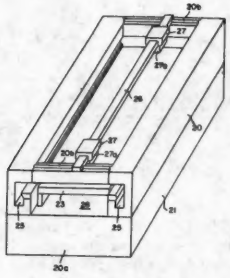
Hideo Takeuchi, Chiba; Michiaki Kobayashi, Kitamoto; Hiroyuki Hashimoto, Tokyo, and Daiji Suzuki, Hachioji, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

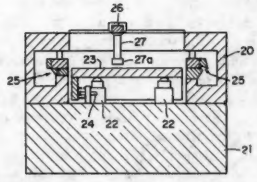
Division of Ser. No. 434,241, Oct. 14, 1982, Pat. No. 4,489,652. This application Jul. 16, 1984, Ser. No. 631,200

Claims priority, application Japan, Oct. 15, 1981, 56-164449; Jan. 25, 1982, 57-9882; Jan. 25, 1982, 57-9884; Jan. 25, 1982, 57-9886; Apr. 30, 1982, 57-73022

Int. Cl.[4] B21D *5/04*

U.S. Cl. 72—12 10 Claims





1. A plate bending machine for bending the lateral edges of printing plates for use in an offset printing press, said machine comprising: a machine bed; plate bending mechansims supported on opposite sides of the machine bed; a shiftable table mounted on the machine bed between the bending mechanism in a manner whereby said table can be shifted freely in any horizontal direction along the upper surface of the machine bed and functioning to securely hold a printing plate mounted thereon; at least one detectin-inscribing unit comprising at least one optical detection sensor to detect datum fine lines inscribed on each of the printing plates held on the shiftable table thereby to generate signals for causing the shiftable table to shift to a specific position; a driving system mounted on the machine bed and coupled to the shiftable table for operating in response to the signals to thus cause the shiftable table to shift to the specific position; and a registered mark inscribing device coupled to the detecting-inscribing unit for inscribing register marks on the printing plate thus held on the shiftable table for an automatic registration on a cylinder plate, which detecting-inscribing unit is so mounted on the machine as to be movable over and along the surface of the shiftable table.

4,594,869

METHOD AND APPARATUS OF MANUFACTURING A COIL SPRING

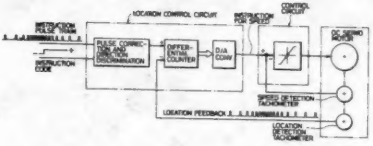
Takeji Matsuoka, Tokyo, Japan, assignor to MEC Machinery Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,816

Claims priority, application Japan, Jul. 15, 1983, 58-127989

Int. Cl.[4] B21F *3/02*

U.S. Cl. 72—21 1 Claim



1. An apparatus for making coil springs comprising:
a driving main shaft driven at a constant speed;
a cam attached to said drive shaft;
a center shaft placed in proximity to said cam
a swaying body having a longitudinal groove attached to said center shaft;
a cam follower on said swaying body and operatively associated with said cam for causing said swaying body to sway about said center shaft in response to the motion of said cam;
a sliding body placed in the longitudinal grove of said swaying body;
a connecting body coupled at one end to said sliding body and having a rack on the other end thereof;
a rotary encoder for emitting electrical pulses in response to rotation of said rotary encoder;
a pinion attached to said rotary encoder for coupling said connecting body's racked end to said rotary encoder;
a location control circuit electrically coupled to said rotary encoder for converting said pulses from said rotary encoder into speed control signals in accordance with instruction codes;
control circuit means coupled to said location circuit means for providing control signals;
a DC servo motor coupled to and controlled by said control circuit means for driving and rotating a core bar for supplying wire material to the coil forming apparatus;
a speed detection tachometer, coupled to said DC servo motor and coupled to said control circuit and providing feedback to said control circuit for altering said control signals produced by said control circuit; and
a location detectors tachometer coupled to said DC servo motor and said location control circuit for altering said speed control signals.

4,594,870

AUTOMATIC BENDING APPARATUS

Hideo Koyama; Takeshi Hoh; Fumio Noguchi, and Yoshiaki Nobuhara, all of Hyogo, Japan, assignors to Shin-Meiwa Industry Co., Ltd., Japan

Filed Nov. 16, 1983, Ser. No. 552,423

Claims priority, application Japan, Nov. 25, 1982, 57-207927; Jul. 25, 1983, 58-136645; Aug. 31, 1983, 58-161611

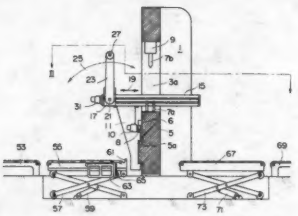
Int. Cl.[4] B21D *43/11, 5/02*

U.S. Cl. 72—24 13 Claims

1. An automatic bending apparatus comprising:
a bending machine including a bottom die and a top die for bending a plate interposed therebetween into a desired form,
means for moving said bottom die and top die towards each other to effect said bending,
gripper means disposed at least in front of said bending machine for holding a portion of said plate, said plate

portion being held in a first position before bending, and in a follow-up position after bending, said plate portion being held continuously during loading, bending, and unloading from said bending machine,

means for movably mounting said gripper means on said bending machine so that said gripper means is variably positionable in a vertical plane in the forward and backward direction of said bending machine as well as around



a horizontal axis orthogonally intersecting with said vertical plane,

calculating means for calculating said follow-up position of said gripper means according to the displacement of said plate, and

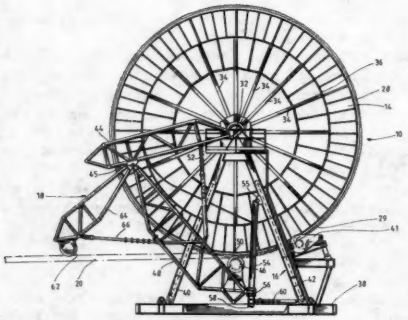
means for controlling the position of said gripper means during bending of said plate, said controlling means being responsive to said calculating means.

4,594,871

REEL TYPE CONTINUOUS MARINE PIPE LAYING SYSTEM

Nico de Boer, Kenner, La., assignor to McDermott, Inc., New Orleans, La.

Filed Jul. 2, 1984, Ser. No. 626,708
Int. Cl.[4] B21D *3/02*
U.S. Cl. 72—164 **13 Claims**



1. A continuous marine pipe laying system comprising:

a pipe reel having a support frame adapted to be mounted on a barge, said reel with pipe coiled thereon defining a pipe support surface;

a support arm pivotally connected to an axis of rotation of said pipe reel;

a first pipe straightening roller for forceably engaging said pipe at a location substantially opposite the departure point where the pipe departs the pipe support surface of the reel, a first roller arm supporting said first roller, said first roller arm being pivotally connected to said support arm at a first predetermined point spaced from said axis of rotation of said reel, said first roller including means for maintaining said roller at said location substantially opposite the departure point as successive layers of pipe are removed; and

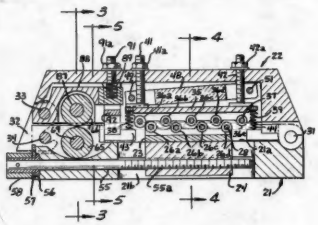
a second pipe straightening roller for forceably engaging said pipe on a side of said pipe opposite said first roller at a position to overbend said pipe such that the pipe exerts said pipe laying system in a substantially rectilinear configuration, said roller being mounted on a second roller arm pivotally connected to said support arm at said first predetermined point.

4,594,872

APPARATUS FOR STRAIGHTENING STRIP MATERIAL

Richard D. Nordlof, 3312 Crest Rd., Rockford, Ill. 61107

Filed Oct. 30, 1984, Ser. No. 666,494
Int. Cl.[4] B21D *1/02*
U.S. Cl. 72—164 **23 Claims**



1. An apparatus for straightening strip material as it passes in one direction therethrough along a stock pass line comprising, a rigid first roller support, a first series of leveler rollers rotatably mounted in parallel relation on the first roller support with their peripheries tangent to a first roller plane, the axes of the leveler rollers of the first series being uniformly spaced apart on the first roller support a fixed distance, a rigid second roller support, a second series of leveler rollers rotatably mounted in parallel relation on the second roller support with their peripheries tangent to a second roller plane, the axes of the leveler rollers of the second series being uniformly spaced apart on the second roller support a fixed distance the same as the spacing of the leveler rollers of the first series, means mounting the first and second roller supports at relatively opposite sides of the stock pass line for relative adjustment along a first path lengthwise of the stock pass line and also for relative adjustment along a second path transverse to the stock pass line, selectively operable longitudinal adjusting means for adjusting the first and second roller supports relative to each other along said first path from a position in which the leveler rollers of one series are each disposed between and equi-distant from two adjacent leveler rollers of the other series to positions in which the leveler rollers of said one series are disposed between and relatively closer to either the upstream one or the downstream one of the two adjacent leveler rollers of the other series, and selectively operable transverse adjusting means for adjusting said first and second roller supports relative to each other along said second path.

4,594,873

METHOD AND APPARATUS FOR PREPARING PIPE SECTIONS FOR WELDING

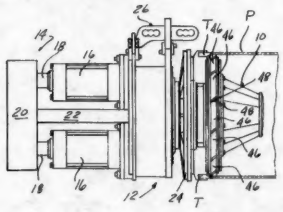
Clyde F. Kaunitz, 2339 Bay Woods Ct., Bay City, Mich. 48706

Filed Oct. 29, 1984, Ser. No. 666,177
Int. Cl.[4] B21D *41/02, 19/00*
U.S. Cl. 72—340 **2 Claims**

1. Apparatus for the on-site preparation of an end of a large diameter metal pipe section of the type employed in cross-country pipe lines for welding end-to-end to a like pipe section comprising:

a frame adapted to be axially inserted into an end of said pipe

section with the main axis of said frame coaxial with the axis of said pipe section, a plurality of pipe expanding shoes mounted in said frame for movement radially of said main axis, said shoes projecting outwardly from said frame at locations symmetrically disposed about said main axis and having radially outwardly facing pipe wall engaging surfaces with the adjacent ends of adjacent shoes circumferentially overlapping each other to cooperatively collectively define a substantially continuous cylindrical surface of relatively short axial length and of a predetermined diameter greater than the original nominal inside diameter of said pipe section when said shoes are at a maximum end limit of radial displacement from said main axis, power drivven expanding means including a drawbar mounted on said frame for reciprocatory movement along said main axis between a first and a second end limit of movement, power means for driving said drawbar in movement between said end limits, a frusto-pyramidal expansion member fixedly and coaxially mounted on said drawbar and having a plurality of like side surfaces uni-



formly inclined to said main axis, a plurality of wedge-shaped shoe blocks respectively slidably supported on said side surfaces and mounted for radial movement in said frame, said shoes being respectively fixedly mounted on said shoe blocks, said expanding means being operable when at said one end limit to locate all of said shoes in a retracted position accommodating axial insertion of said shoes into one end of said pipe section and being operable upon movement toward said second end limit to simultaneously drive all of said shoes radially outwardly of said frame into contact with the inner surface of said pipe and upon power driven movement of said expanding means to said second end limit to radially expand the end of said pipe beyond the elastic limit of the metal of said pipe to a predetermined inside diameter larger than said original nominal inside diameter, and means mounted on said frame for rotation about said main axis for machining the end surface of said pipe to a predetermined configuration while said end of said pipe is held at said predetermined inside diameter by said expanding means.

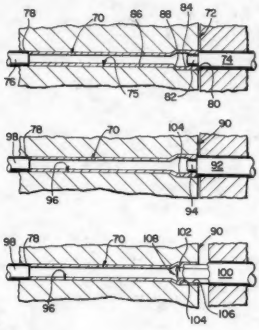
4,594,874

METHOD OF FORMING SOCKET WRENCHES FROM TUBING

Fred A. Bononi, Simsbury, and Armand J. Weis, deceased, late of North Granby, both of Conn. by Delma G. Weis, legal representative., assignors to Veeder Industries Inc., Hartford, Conn.

Filed Jul. 11, 1983, Ser. No. 512,677
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—356 **16 Claims**

1. A method of forming a socket wrench and other elongated hollow parts, such as a nutdriver, from a workpiece of metallic tubing having a generally uniform circular transverse cross section and a generally uniform wall thickness, the method comprising the steps of elongating the workpiece by driving the workpiece into a die cavity means with a power operated punch to cold extrude a leading axial portion of the workpiece, the elongating step being effected to increase the length of the workpiece by reducing both the inside and outside diameters at one end of the workpiece and along said leading axial portion extending a predetermined length from said one end and forming a longitudinally extending shaft of reduced diametrical dimensions relative to the original diametrical dimensions of the workpiece, maintaining the wall thickness along said longitudinally extending shaft generally equal to the original wall thickness of the workpiece during the elongating step, and broaching a recess of non-circular cross



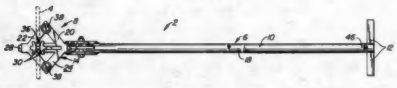
section at the other end of the workpiece opposite its said one end by driving a second power operated punch of non-circular cross section into said other end of the workpiece, maintaining the increased workpiece length and reduced dimension of the cross sectional diameter of said longitudinally extending shaft relative to said other end of the workpiece during the broaching step, and continuously retaining a circular transverse cross section throughout the length of the workpiece during the elongating and broaching steps.

4,594,875

BENDING MACHINE

Leonard J. Schweitzer, 3272 Susileen Dr., Reno, Nev. 89509

Filed Sep. 19, 1984, Ser. No. 652,771
Int. Cl.[4] B21D *7/00*
U.S. Cl. 72—389 **10 Claims**



2. A hand operated device for bending a metal bar in a horizontal plane comprising:

(a) a base;

(b) guideway means at one end of said base; and an upwardly open slot communicating with the guideway;

(c) a support extending laterally from the guideway means and having a top surface being generally level with a top surface of the guideway means;

(d) first and second spaced apart vertical posts attached to the support;

(e) a slide located within the guideway and being reciprocal perpendicularly to a line connecting the posts, the guideway being defined by a tubular member, and the slide being disposed within the tubular member and having a length which is several times larger than its transverse width to provide positive guidance for the slide within the tubular member as it reciprocates therein;

(f) first and second upwardly directed lugs attached to said slide and projecting through the slot, the lugs being

spaced apart so as to form a groove for accepting the metal bar for bending;

(g) an elongated handle pivotally mounted to the base; and

(h) connecting means for connecting the slide to the handle for translating pivotal handle movements into linear slide movement, the connecting means including

(i) a lever;

(ii) first attachment means attaching one end of the level to the handle;

(iii) a link slidable with and movable relative to the slide;

(iv) second attachment means attaching one end of the link to the slide; and

(v) third attachment means attaching the link at another end to the lever.

4,594,876

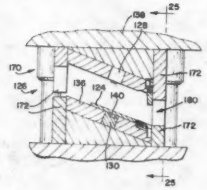
APPARATUS FOR FORMING THE STITCH FORMING AREA OF A SEWING MACHINE THROAT PLATE

Robert Zorn, and David Dispennett, both of Chicago, Ill., assignors to Union Special Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 557,713, Dec. 2, 1983, abandoned, which is a division of Ser. No. 315,335, Oct. 26, 1981, Pat. No. 4,430,878. This application Jun. 1, 1984, Ser. No. 616,512

Int. Cl.⁴ B21D *11/22, 43/26*

U.S. Cl. 72—414 **1 Claim**



1. An apparatus used in swaging a stitch tongue profile in a sewing machine throat plate blank, comprising:

a power press having an operative end movable relative to a base and having means to drive said press so as to develop progressively increased pressures during swaging, said operative end being movable along an axis;

a first support means having a workpiece contacting surface secured to said operative end of said power press for reciprocal movement therewith, said workpiece contacting surface being obliquely oriented relative to said axis;

a forming punch secured to said first support means, said forming punch including a male segment having a configuration which is a mirror image of that required for the stitch tongue profile;

a second support means having a workpiece contacting surface disposed on said power press base, said workpiece contacting surface of said second support means oriented at an angular disposition corresponding to that of said first support means;

a die secured to said second support means, said die having a cavity dimensioned to lock in the throat plate blank and to control the displacement of material created when said forming punch is pressed against said blank with increasing pressure;

self compensating means for preventing endwise displacement of said blank during the swaging process, said self compensating means includes a camming member movably coupled to one of said first and second support means relative thereto and along a path generally parallel to said axis, a tool slidably mounted on the workpiece contacting surface of the other of said first and second support means, said tool being disposed proximate one end of said located throat plate blank on said workpiece contacting surface of said second support means, said camming means forcibly urging said tool along its respective workpiece contacting surface when said first support means moves towards said second support means; and

means for maintaining a consistent sliding relationship between said punch and die.

4,594,877

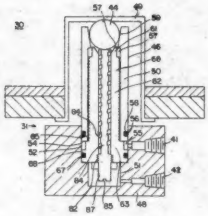
PNEUMATIC DEADWEIGHT TESTER INCORPORATING DAMPENING MEANS

Robert A. Kyker, Collinsville, Okla., assignor to EG&G Chandler Engineering Company, Tulsa, Okla.

Filed Sep. 17, 1984, Ser. No. 651,377

Int. Cl.⁴ G01L *27/00*

U.S. Cl. 73—4 D **16 Claims**



1. In a deadweight testing system comprising nozzle means, inlet means in said nozzle means, pressure responsive means for supporting preselected weights, and fluid outlet means the improvement wherein said outlet means comprises a substantially helical path extending from the area adjacent said pressure responsive means along an axis of the nozzle to an exit port, said helical exit path means having increasing cross section with distance from said pressure responsive means, whereby said exit path means comprises dampening means.

4,594,878

DYNAMIC FRICTION COEFFICIENT MEASURING APPARATUS

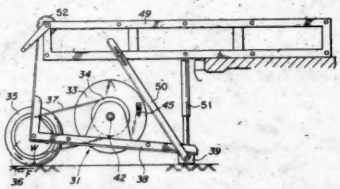
Yuya Abe, Tokyo, and Toshio Sawa, Sayama, both of Japan, assignors to Nippo Sangyo Co. Ltd., Kokubunji, Japan

Filed Jun. 19, 1984, Ser. No. 622,345

Claims priority, application Japan, Jun. 24, 1983, 58-112658; Jan. 18, 1984, 59-005652

Int. Cl.⁴ G01N *19/02*

U.S. Cl. 73—9 **11 Claims**



1. A dynamic friction coefficient measuring apparatus for continuously measuring and automatically recording dynamic frictional forces comprising:

(A) a frame;

(B) a driving means, including a permanent-magnet DC motor, for imparting a driving force in an activated mode and generating an electromotive force in a deactivated mode, said electromotive force being representative of speed of the motor in said deactivated mode;

(C) a holder on said frame for supporting said driving means;

(D) friction measuring means on said frame including

a first disc having friction measuring rubber members disposed thereon,

a driving disc connected to the motor for receiving the driving force and adapted to rotate coaxially with said first disc,

dynamometer means responsive to coaxial displacement between said first disc and said driving disc for generating a first electrical signal indicative of said displacement,

(E) tachometer means for receiving said electromotive force generated by the motor in said deactivated mode and for deriving a second electrical signal indicative of peripheral speed of said rubber members; and

(F) an X-Y recorder for simultaneously recording said first and said second signals onto rectangular coordinates.--

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4,594,879

THERMAL CONDUCTIVITY DETECTOR

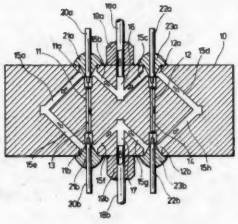
Masato Maeda, and Shuzo Kawamura, both of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,064

Claims priority, application Japan, Oct. 28, 1982, 57-189551; Oct. 29, 1982, 57-164150[U]

Int. Cl.⁴ G01N *25/18*

U.S. Cl. 73—27 R **2 Claims**



1. A thermal conductivity detector comprising

a pair of block structures, each block structure comprising

a first through hole having two ends,

a second through hole having two ends,

a first bypass passageway having two ends,

a second bypass passageway having two ends,

an inlet means connecting one end of said first through hole, one end of said second through hole, one end of said first bypass passageway and one end of said second bypass passageway,

an outlet means connecting another end of said first through hole, another end of said second through hole, another end of said first bypass passageway and another end of said second bypass passageway, and

associated with each bock structure, a first heater disposed within said first through hole, and a second heater disposed within said second through hole;

said detector further comprising means for connecting said first heater and said second heater of each block structure in an electrical bridge to detect thermal conductivity of a fluid to be measured using an unbalanced voltage of said bridge;

wherein a fluid to be measured is applied to said inlet means in one block structure of said pair of block structures;

wherein a reference fluid is applied to said inlet means in the other block structure of said pair of block structures;

and wherein said first and second bypass passageways in said one block structure is different in internal diameter from said first and second bypass passageways in said other block structure.

4,594,880

APPARATUS FOR DETERMINING FINISHED ROLL DENSITY IN A MILL

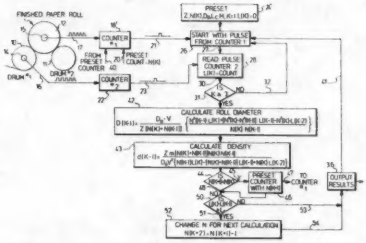
James C. Murdoch, Cavan, and Clarence J. Klassen, Peterborough, both of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Dec. 27, 1984, Ser. No. 686,695

Claims priority, application Canada, Dec. 14, 1984, 470173

Int. Cl.⁴ G01N *9/00*

U.S. Cl. 73—32 R **5 Claims**



1. Apparatus for determining the density of a paper roll on a paper winding means comprising

a paper receiving roll on said paper winding means for receiving a web of paper,

means for feeding said web of paper onto said paper receiving roll,

means for rotating said paper receiving roll to wind said web of paper onto said roll,

means for providing a first signal representing the rotation of said paper receiving roll,

counter means connected to said means for providing a first signal to receive said first signal and count the number of rotations of said paper receiving roll as represented by said first signal until a variable, preset count number N is reached for providing a second signal representing each count of N,

memory means connected to said counter means to store the number of counts of N, the number of counts being represented by K,

means to provide a third signal representing the length L of said web of paper wound on said paper receiving roll,

comparison means for comparing said third signal with a preselected value representing length and for providing a fourth signal when said third signal exceeds said preselected value,

means responsive to said fourth signal for decrementing N, and

means for determining paper roll density at intervals represented by K or a multiple thereof.

4,594,881

PRESSURE DETECTING APPARATUS

Takumi Imamura, Kasiwa, Japan, assignor to Nihon Kuatsu System Corp., Ltd., Japan

Filed Dec. 27, 1984, Ser. No. 686,845

Claims priority, application Japan, Aug. 9, 1984, 59-121458[U]

Int. Cl.⁴ G01B *13/12*

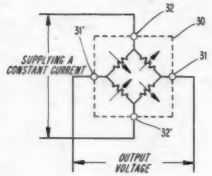
U.S. Cl. 73—37.5 **4 Claims**

1. A pressure detecting apparatus comprising:

(a) a pneumatic bridge circuit having a subject and a reference pressure path connecting an air supply inlet to the atmosphere and to a detecting nozzle, respectively, said reference pressure path including a first orifice and a valve opening to the atmosphere, said subject pressure path including a second orifice and means for connection to said detecting nozzle, said reference pressure path con-

nected to a reference pressure inlet of a pressure detecting sensor between said first orifice and said valve, said subject pressure path connected to a subject pressure inlet of said pressure detecting sensor between said second orifice and said nozzle connection;

(b) said pressure detecting sensor including a piezo-resistance pressure detecting element operable to detect the pressure difference between said reference pressure inlet and said subject pressure inlet, said pressure detecting



element operable under constant current supply to generate a voltage output signal corresponding to said pressure difference;

(c) an amplifier circuit for converting said voltage signal into an analog signal;

(d) a comparator circuit for comparing said analog signal with a reference voltage and operable to generate an on-off binary signal; and

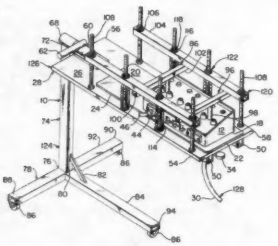
(e) an output circuit for converting said binary signal into a control output signal.

4,594,882

PORTABLE WORK STAND TO QUICKLY RECEIVE, SEAL, AND ROTATE, A CYLINDER HEAD OF AN ENGINE DURING LIQUID LEAK TESTING

Thomas E. Wheeler, 18018 74th St. East, Bonney Lake, Wash. 98390

Filed Jan. 17, 1984, Ser. No. 571,434
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—49.7 **1 Claim**



1. A portable work stand to quickly receive, hold, seal, rotate, and supply with test water, a cylinder head of an engine during liquid leak testing of the engine coolant passageways in the cylinder head, while the fire deck of an engine cylinder head is sealably bearing against an overall continuous gasket, comprising:

(a) a frame assembly having:

(1) a horizontal frame of a tee configuration having an intersecting cross head portion and a leg portion;

(2) three caster wheels on the horizontal frame;

(3) a vertical column upstanding on the horizontal frame at the tee intersection of the cross head portion and the leg portion; and

(4) a horizontal bearing shaft at the top of the vertical column adapted for securement to a horizontal table; and

(b) a horizontal table having:

(1) an overall continuous gasket, to underlie a fire deck of an engine cylinder head, secured to the top surface of the table, having one orifice to accommodate the entry of hot testing water;

(2) a cylindrical bearing secured to one end of the table for rotatable placement over the horizontal bearing shaft at the top of the vertical column;

(3) a friction lock on the cylindrical bearing to hold this bearing at a given position about the horizontal bearing shaft;

(4) a threaded orifice in the table to receive a valve of a hot water system; and

(5) eight holes in the table adapted to receive eight vertical hold down bolts of a clamp down assembly; and

(c) a clamp down assembly having:

(1) eight spaced vertical hold down bolts, with four of them secured to one respective side of the horizontal table, and four of them secured to the other respective side;

(2) eight copression springs placed down and over the eight vertical hold down bolts;

(3) two spaced apart horizontal and longitudinal rails having eight spaced through receiving holes placed over and down the eight spaced vertical hold down bolts to rest against the compression springs;

(4) eight fasteners to secure the two spaced apart horizontal and longitudinal rails to the eight spaced vertical hold down bolts at selective heights above the horizontal table; and

(5) two transverse tee hold downs, each having a transverse horizontal cross head and each having a depending vertical leg, depending from the transverse horizontal cross head, adapted to bear down on a cylinder head of an engine, in turn positioned on the gasket of the table, and each transverse horizontal cross head is arranged so the ends thereof extend underneath the two spaced apart horizontal and longitudinal rails, so when the eight fasteners are tightened, each transverse tee hold down bears down on a cylinder head of an engine; and

(d) hot water testing assembly having:

(1) an intake hose to be connected to a hot water source under pressure;

(2) a valve connected to the intake hose;

(3) a pressure gauge interconnected between the valve and the table;

(4) an outlet valve to be connected to a coolant water dischange orifice on a cylinder head of an engine being tested for possible leaks in the coolant passageways, and

(5) a discharge hose connected to the outlet valve for directing discharged test water toward a drain.

4,594,883

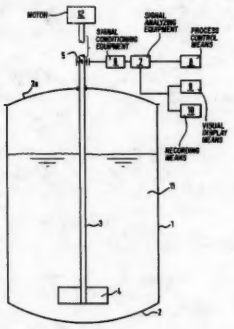
MONITORING PHYSICAL PROPERTIES OF A FLUID

Geoffrey J. Pollard, Newport Pagnell, England, assignor to The British Hydromechanics Research Assoc., Cranfield, England

PCT No. PCT/GB84/00149, § 371 Date Dec. 21, 1984, § 102(e) Date Dec. 21, 1984, PCT Pub. No. WO84/04388, PCT Pub. Date Nov. 8, 1984
PCT Filed May 3, 1984, Ser. No. 684,926
Claims priority, application United Kingdom, May 3, 1983, 8312071; Nov. 3, 1983, 8329334
Int. Cl.[4] G01N *11/14*
U.S. Cl. 73—54 **10 Claims**

1. Apparatus for the measurement of properties of a fluid comprising a chamber, a stirrer shaft extending into the chamber, impeller means on said shaft within said chamber, means to impart a constant angular velocity to said shaft and to said impeller means, and sensor means for detecting conditions within the chamber comprising:

a. transducers for detecting vibration of the stirrer shaft during said constant angular velocity;
b. signal conditioning equipment operatively connected to the transducers to provide signals representing vibration of the stirrer shaft; and



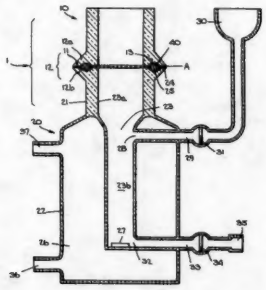
c. analyzing equipment for receiving said signals for providing indications of the flow characteristics of liquid in said chamber based on said signals.

4,594,884

DIFFUSION MEASURING DEVICE

Joseph V. Bondi, Collegeville, and Lucille A. Grabowski, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 21, 1984, Ser. No. 622,926
Int. Cl.[4] G01N *13/00*
U.S. Cl. 73—64.3 **3 Claims**



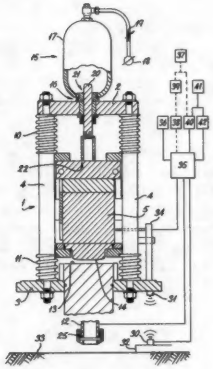
1. An apparatus for measuring diffusion across a membrane comprising:
(a) a sample chamber for retaining a sample of test material to be tested for extent of diffusion or penetration through a test membrane, said chamber being open at both ends and positioned so that the openings are in a vertical relationship, said chamber being provided at the lower end along the perimeter with a planar surface of a channeled glass joint,
(b) a receptor chamber for retaining solvent or dispersing medium for the test material which diffuses or penetrates across the test membrane, said chamber being a vertical, elongated body with height at least twice that of width, being open at the upper end and closed at the lower end and being provided at its upper end along the perimeter with a planar surface of a channeled glass joint, said planar surface to complement and coact with the opposing planar surface of the sample chamber, said receptor chamber provided with a solvent inlet means near the upper end of the chamber and a sampling outlet means at the bottom edge of the chamber and further being jacketed for temperature control and having dlsposed within said chamber a covered bar magnet adaptable to being impelled when the chamber is on a timing motor thereby providing a stirring motion,
(c) a flexible ring adaptable to being seated in the channels of opposing faces of the glass joint and to coact with the joint surfaces to hold the test membrane in position;
(d) a solvent reservoir mainteined above the elevation of the test membrane, wherein the inlet means in said receptor chamber is a tubular arm extending substantially horizontally away from the chamber for a short distance and thereafter extending upward to the solvent reservoir and wherein the outlet means is a tubular arm extending substantially horizontally from the cell and fitted with a stopcock for flow control.

4,594,885

APPARATUS FOR DRIVING TESTING PROJECTILES

Albert A. Rodger, Aberdeen, Scotland, assignor to National Research Development Corporation, London, England

Filed Nov. 1, 1984, Ser. No. 667,444
Claims priority, application United Kingdom, Nov. 3, 1983, 8329383
Int. Cl.[4] G01N *33/24*
U.S. Cl. 73—84 **7 Claims**

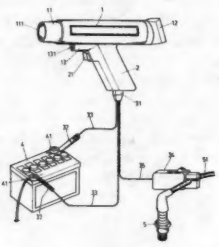


1. Projectile-propelling apparatus comprising:
a projectile in the form of a coring tube adapted to take core samples from the ground;
an anvil presented by said projectile;
a hammer adapted both for connection to a vibrator unit and to oscillate relative to said projectile under resilient restraint;
said resilient restraint including a resilient spring-mass-spring connection between said hammer and said projectile whereby said hammer when driven by such a said vibrator unit may drive said projectile either in an impact mode in which contact occurs cyclically between said hammer and said anvil or in a vibratory mode in which no such contact takes place;
a signal producing instrument adapted, as said projectile penetrates ground to take said core samples, to produce an output indicative of the resistance of said ground to penetration by said projectile.

4,594,886
MULTIPURPOSE TIMING LIGHT

Duke Chen, 9th Fl., No. 75, Nanking E. Road, Sec. 4, Taipei, Taiwan

Filed Mar. 4, 1985, Ser. No. 707,555
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 1 Claim

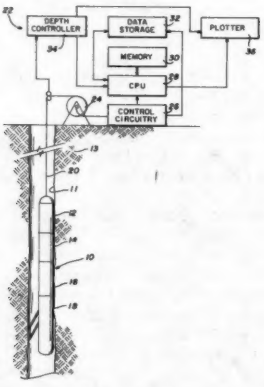


1. A multipurpose ignition timing light comprising
a main body-gun shaped structure having a bored barrel and an attached handle extending from said barrel;
a timing light means including a xenon light in the bore of said barrel and a convex lens at an end of said barrel, aligned with said neon light;
a tachometer means on said body structure having a display panel on the opposite end of said barrel from said convex lens to indicate engine speed;
a lighting means mounted beneath said barrel emitting a beam of light aligned substantially parallel with a beam of flashing light emitted from said neon light through said convex lens at said end of said barrel;
switching means including a trigger mounted on said attached handle; and
connecting means on said handle to receive connections from an electric source and a source of induced current.

4,594,887
METHOD AND APPARATUS FOR DETERMINING CHARACTERISTICS OF CLAY-BEARING FORMATIONS

Walter H. Fertl, and Naum Rukhovets, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 13, 1982, Ser. No. 416,826
Int. Cl.[4] E21B *47/00;* G01R *27/00*
U.S. Cl. 73—152 62 Claims

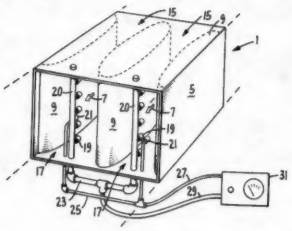


1. A method of determining characteristics of clay-bearing formations, without the necessity of taking formation samples, comprising the steps of;
determining the volume of clay contained in said formations at least one depth horizon therein;
determining a first property of said volume of clay; and
determining at least one characteristic of said formations in response to said first property of said volume of clay.

4,594,888
AIRFLOW MEASURING SOUND ATTENUATOR

Kenneth W. DeBaun, Santa Rosa, Calif., and Robert H. Morris, Randolph, N.J., assignors to Air Monitor Corporation, Santa Rosa, Calif.

Filed Feb. 19, 1985, Ser. No. 703,025
Int. Cl.[4] G01F *1/46, 15/00*
U.S. Cl. 73—198 1 Claim

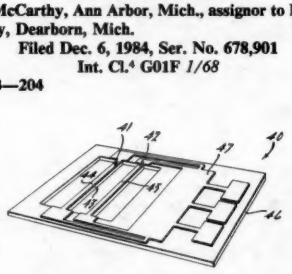


1. An airflow measuring sound attenuator for air flowing through a duct comprising baffles within the duct defining at least one divergent outlet throat and a velocity measuring means at said divergent throat in the region of profiled and stabilized duct airflow, said velocity measuring means being spaced downstream from the throat outlet outside said attenuator.

4,594,889
MASS AIRFLOW SENSOR

Shaun L. McCarthy, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 6, 1984, Ser. No. 678,901
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 1 Claim



1. A mass airflow sensor including:
a generally planar silicon substrate with a first, a second, and a third opening formed through said substrate and a first integral, elongated wire-like silicon member between said first and second openings and a second integral, elongated wire-like silicon member between said second and third openings;
a silicon dioxide coating formed on said first and second silicon members;
a first platinum metal coating formed on said silicon dioxide coating on said first silicon member adapted to be used as a hot wire mass airflow sensor;
a pair of conductive terminals, one terminal positioned at

each end of said first silicon member on said silicon dioxide coating and in contact with said first platinum metal coating;

a second platinum metal coating formed on said silicon dioxide coating on said second silicon member adapted to be used as an air temperature sensor;

said silicon dioxide coating having a thickness of about 0.5 microns;

said first and second silicon members each having a length of about 3 millimeters and a cross section dimension approximately in the range of about 1 mil to 3 mils; and

an integrated circuit formed on said silicon substrate to cooperate with the mass airflow sensor silicon element and the air temperature sensor silicon element and to contact said first and second metal coatings on said first and second silicon members, respectively.

4,594,890

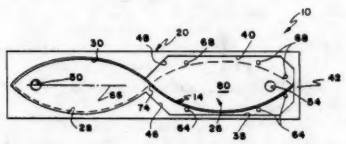
FLUID FLOW MEASURING DEVICE

Hugh M. Baker, Jr., Green Hills Lake, P.O. Box 27B, R.D. 1, Mohnton, Pa. 19540

Continuation of Ser. No. 404,888, Aug. 3, 1982, abandoned, which is a continuation of Ser. No. 243,974, Mar. 16, 1981, abandoned, which is a continuation of Ser. No. 90,583, Nov. 2, 1979, abandoned. This application Mar. 27, 1984, Ser. No. 593,930

Int. Cl.[4] G01F *3/36*

U.S. Cl. 73—232 **14 Claims**



1. A fluid meter comprising

a housing having a cavity therein;

a bi-stable resilient member housed within and dividing the cavity into first and second chambers and being monooscillatably movable between only a pair of stable positions in response to fluid flow into and out of the chambers, the resilient member having spring bias and being constrained for movement into one of only the pair of stable positions;

means providing fluid communication into and out of the first and second chambers, the direction of fluid flow to and from the chambers being determined by the position of the bi-stable resilient member; and

means for counting the oscillations of the member.

4,594,891

RESONATING ROD

Karl Benz, Schiltach, and Gerhard Huber, Wolfach-Kinzigtal, both of Fed. Rep. of Germany, assignors to VEGA Grieshaber GmbH & Co., Schiltach, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,866

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3215040

Int. Cl.[4] G01F *23/28*

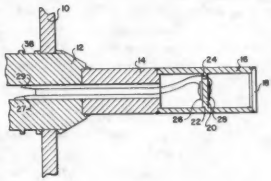
U.S. Cl. 73—290 V **18 Claims**

1. An apparatus for determining the filling level of a material in a container comprising:

(a) an elongated hollow tubular body adapted to vibrate;

(b) a transverse member extending normal to the longitudinal axis of said tubular body, fixed to at least two points on the inner surface of said tubular body, and located between the ends of said tubular body, said transverse member having first and second opposite surfaces;

(c) a first electromechanical transducer located within said tubular body, mounted on said first surface of said transverse member and connected to an electrical conductor for supply of electrical oscillation energy, for causing said first transducer to vibrate when excited and transmit said vibrations to said transverse member and said tubular body; and



(d) a second electromechanical transducer located within said tubular body and coupled thereto for vibrating therewith, and connected to an electrical conductor for transmitting electrical signals to a detection means;

whereby upon excitation of said first electromechanical transducer, said transverse member and said tubular body are caused to vibrate, causing said second electromechanical transducer to transmit a signal to said detection means, the amplitude of the signal depending upon the damping effect on said tubular body of the material whose level is being determined.

4,594,892

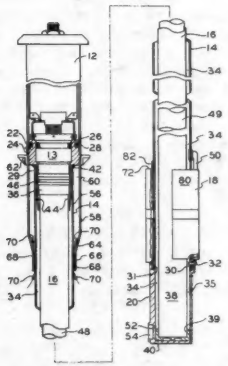
CAPACITANCE PROBE FOR LIQUID LEVEL MEASURING SYSTEM

Einar Asmundsson, Middle Haddam, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Jun. 7, 1985, Ser. No. 742,460

Int. Cl.[4] G01F *23/26*

U.S. Cl. 73—304 C **18 Claims**



1. In a liquid-level-measurement capacitance probe of the type having an elongated capacitor sensor assembly with a capacitor chamber for receiving fuel for measuring capacitance values within said capacitor chamber to calculate fuel level in a storage tank, a filter device for removing water from the fuel flowing into the capacitor chamber comprising:

an elongated annular filter housing forming at least one interior filter chamber and being mounted coaxially about the capacitor sensor assembly, said housing having an

axial bore with said capacitor sensor assembly extending through said bore,

said filter chamber having an upper end and a lower end vertically below said upper end, an outlet port at said upper end interconnected to said capacitor chamber, an inlet port at said lower end adapted to be in fluid communication with the fuel storage tank to be measured, a filter means located in said filter chamber intermediate said upper and lower ends for separating water from fuel passing through said filter chamber and out said outlet port so that water separated from the fuel gravitates to the lower end of the filter chamber, a water discharge port at the lower end of the chamber, and means for regulating the discharge of water through said water discharge port.

4,594,893

PROBE FOR MEASURING THE LEVEL OF LIQUID IN A TANK OR PIPE

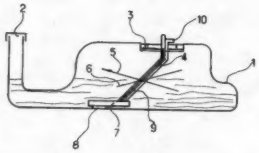
Claude Lombard, Le Chesnay, and Michel Warenghem, Suresnes, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Aug. 1, 1984, Ser. No. 636,630

Claims priority, application France, Aug. 3, 1983, 83 12775

Int. Cl.[4] G01F *23/26*

U.S. Cl. 73—304 C **43 Claims**



1. A capacitive probe for measuring the level of liquid in a tank, said capacitive probe comprising a housing containing an upper part serving to measure the level of liquid and a connected lower part which, during use of the probe, is always immersed in the liquid to be measured, serving as a reference capacitor, the two parts freely communicating with the liquid to be measured by at least one orifice provided in the housing for this purpose, the upper part comprising two spaced, parallel measuring capacitors identical in length and having identical capacitances (C_2, C_3), the reference capacitor having capacitance (C_1) and having two plates, one of which is electrically connected to a plate of one of the two measuring capacitors and, with said one of the two measuring capacitors, forming a unit of capacitance of the sum of the capacitances (C_1+C_2) of the reference capacitor and said one of the two measuring capacitors.

4,594,894

ANGULAR VELOCITY SENSOR

E. Marston Moffatt, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 4, 1984, Ser. No. 647,519

Int. Cl.[4] G01P *15/00*

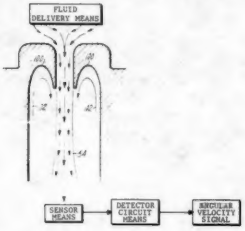
U.S. Cl. 73—515 **4 Claims**

1. Angular velocity sensor means, comprising:

housing means, for enclosing a jet chamber having a reference jet axis and having nozzle means disposed at one end of said chamber for discharging a fluid jet along said reference jet axis, said fluid jet surrounded by a fluid vortex which meets said jet at the exit of said nozzle;

fluid delivery means, for delivering a fluid under pressure to said nozzle to form said fluid jet;

sensor means, having at least one pair of sensing elements, disposed symmetrically, at an opposite end of said chamber, about said reference jet axis in a plane perpendicular thereto, each pair of sensing elements being cooled differentially in response to deflection of said fluid jet from said reference jet axis in the presence of sensor rotation about a rotation axis perpendicular to said reference jet axis, said deflection being in proportion to the angular velocity of said sensor, each of said sensing elements having resistance values which vary according to the amount of cooling received by each;



detector circuit means, responsive to said sensing elements' resistance values for providing signals indicative of said angular velocity; and

fluid vortex shaping means for directing vortex flow substantially parallel to and in the same direction as the jet flow at said exit of said nozzle where said vortex meets said jet.

4,594,895

ULTRASONIC MEASUREMENT METHOD, AND APPARATUS THEREFOR

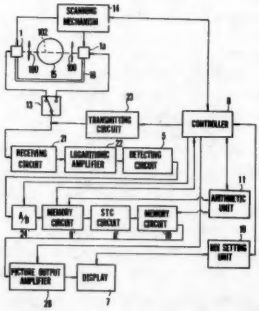
Tadashi Fujii, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1984, Ser. No. 651,963

Claims priority, application Japan, Oct. 6, 1983, 58-186027

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—599 **10 Claims**



6. An ultrasonic measurement apparatus for measuring acoustic characteristics of an object under investigation by transmitting ultrasonic pulses into the object and detecting an ultrasonic echo signal reflected from within the object, said apparatus comprising:

ultrasonic transceiving means for transmitting ultrasonic pulses into the object from a first direction and detecting a first ultrasonic echo signal reflected from within the object, and for transmitting ultrasonic pulses into the object from a second direction opposite to the first direction and detecting a second ultrasonic echo signal reflected from within the object;

pulse identifying means for identifying first and second echo pulses corresponding to a region of interest within the

object, from the first and the second ultrasonic echo signals detected by said ultrasonic transceiving means, respectively;

arithmetic means for calculating the acoustic characteristics of the region of interest from the amplitude values of the first and the second echo pulses identified by the pulse identifying means; and

display means for displaying the calculated acoustic characteristics in the form of a visible image corresponding to the region of interest.

4,594,896

METHOD OF AND DEVICE FOR SCANNING OBJECTS BY ULTRASOUND ECHOGRAPHY

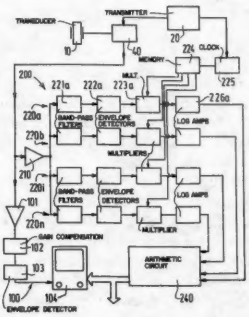
Jean-Francois Cardoso, Paris; Mathias Fink, Strasbourg, and Francois Hottier, La Varenne-Saint-Hilaire, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 11, 1984, Ser. No. 659,798

Claims priority, application France, Oct. 28, 1983, 83 17282

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—599 **3 Claims**



1. A method for scanning objects by ultrasound echography comprising the steps of:

repeatedly transmitting ultrasonic signals into the objects and receiving therefrom ultrasonic echoes which correspond to the principal obstacles encountered by the transmitted signals in their propagation direction;

generating echo signals which correspond to the received echoes and splitting said echo signals into a plurality of approximately equally-wide, consecutive frequency bands which together substantially cover all frequencies in said echo signals;

detecting the envelope of the echo signals in each frequency band;

multiplying each of the detected envelopes by correction signals which compensate them for diffraction effects to produce corrected envelope signals;

determining logarithm signals from each of said corrected envelope signals;

calculating a slope signal $\beta f_i'$ for each of said logarithm signals;

calculating the logarithm of the slope signals $\beta f_i'$;

generating a table or curve which describes the relationship between the value log f_i of the most representative frequency f_i in each channel and the logarithm of the slope signal log $\beta f_i'$ which was determined in the previous step; and

determining the slope of the relationship described by said table or curve and the value of the ordinate of the intercept of said curve at log f=0.

4,594,897

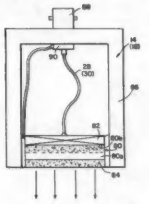
INSPECTION OF THE INTERNAL PORTION OF OBJECTS USING ULTRASONICS

Walter J. Bantz, Coopersburg, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 27, 1984, Ser. No. 574,327

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—600 **26 Claims**



1. A system for detection of imperfections and measurement of properties of the internal portion of an object including

(a) a source of ultrasonic acoustic energy generating a wave mode which propogates along said object under test,

(b) a receiver transducer spaced from said object and coupled by ambient air with ultrasonic vibrations emitted from said object,

(c) means forming a part of said receiver transducer for matching acoustic impedance and optimizing the coupling efficiency of said emitted ultrasonic vibrations from ambient air into a piezoelectric material, said means comprised of at least first and second juxtaposed layers of material having an acoustic impedance, said second layer of material being disposed remote from said piezoelectric material having a thickness equivalent different from said first material and equal to a quarter wave-length, and

(d) detector means for detecting any attenuation of the energy level of said emitted ultrasonic vibrations which characterizes the physical make-up of said object under test.

4,594,898

FORCE SENSORS

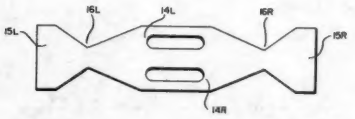
Richard G. Kirman, Chelmsford, and Roger M. Langdon, Colchester, both of England, assignors to Fisher Controls International, Inc., Marshalltown, Iowa

Filed Jun. 6, 1984, Ser. No. 617,712

Claims priority, application United Kingdom, Jun. 7, 1983, 8315565

Int. Cl.[4] G01L *1/10*

U.S. Cl. 73—778 **13 Claims**



1. A beam structure for a vibrating beam force sensor of the type wherein a beam or strip of a piezoelectric material mounted at either end is piezoelectrically driven into flexural vibration while under stress, a change in the vibrational frequency indicating a change in the stressing force, wherein the structure comprises at least three coplanar beams, a common pair of mountings for these beams, and the beams are spaced side by side and supported between the common mountings one at either end of the beams for flexural vibration in a plane normal to the beams' common plane, and wherein the three coplanar beams generally are of the same length, but the breadth of each of the two outer beams is half that of the inner

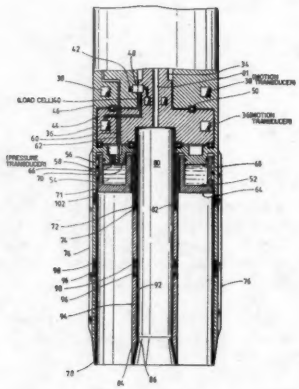
one, said beams in operation flexing in a direction normal to the plane of the beams, with the two outer beams flexing in opposite phase to the inner beam.

4,594,899

METHOD AND APPARATUS FOR TESTING SOIL

Robert Henke, and Wanda K. Henke, both of 13610 Pinerock, Houston, Tex. 77079

Filed Mar. 6, 1984, Ser. No. 586,799
Int. Cl.[4] G01N *3/00, 3/32*
U.S. Cl. 73—784 **35 Claims**



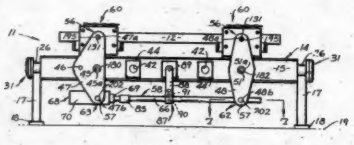
1. A method of testing soil comprising the steps of:
inserting a pair of concentric open ended cylinders into the soil to be tested;
funneling said soil into the inner of said cylinders so as to space the soil from the inner surface of said inner cylinder;
torsionally exciting the inner of said cylinders by rotating it through a limited arc oscillatory motion about its cylindrical axis; and
obtaining a measure of the resistance of the soil to the excitation of the inner cylinder.

4,594,900

AXIAL LOAD TESTING MACHINE

Roy F. Pellerin, Pullman, Wash.; William L. Galligan, Salem, Oreg., and George F. Eberle, St. Louis, Mo., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Apr. 25, 1985, Ser. No. 727,265
Int. Cl.[4] G01N *3/10*
U.S. Cl. 73—806 **21 Claims**



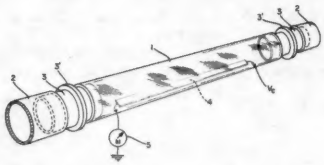
1. A testing machine for testing axial load carrying ability of an elongate test specimen, comprising:
a frame;
at least one first transverse arm mounted nonrotatably upon said frame;
at least one second transverse arms pivotally mounted upon said frame at a location spaced from said first transverse arm;
a force member extending between and pivotally connected to said first and second transverse arms; said force member being adjustable in axial length to thereby pivot said second transverse arm upon said frame;
specimen engagement means pivotally mounted upon said first and second transverse arms for engaging said specimen and applying an axial load thereto; and
force transducer means for measuring the force applied to the specimen by said force member.

4,594,901

ELECTROSTATIC FLOW METER

Eugene Norman, Green Bay, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 9, 1984, Ser. No. 669,966
Int. Cl.[4] G01F *1/64*
U.S. Cl. 73—861.04 **4 Claims**



1. A device for measuring the flow of cellulosic particulates transported within a conduit by a gaseous medium comprising:
(a) a plastic semi-conductive static charge-generating element, electrically insulated from the conduit and which replaces a portion or segment of the conduit wall, said element having a surface on which static charges are generated when exposed to the flow of particulates;
(b) a grounded electrical conductor which is electrically insulated from the conduit and in contact with the static charge-generating element; and
(c) means for measuring electrostatic current flowing through the conductor from the static charge-generating element to ground, wherein the flow of particulates within the conduit generates a measurable electrical current through the conductor which is proportional in magnitude to the mass flow rate of particles in the conduit.

4,594,902

METHOD AND APPARATUS FOR SAMPLE RETRIEVAL FROM PHARMACEUTICAL DISSOLUTION TESTERS

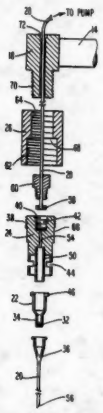
Bruce J. Compton, Pittsford, and Orville N. Hinsvark, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 23, 1985, Ser. No. 768,596
Int. Cl.[4] G01N *1/00*
U.S. Cl. 73—863.23 **8 Claims**

1. Apparatus for retrieving samples from a vessel containing a formulation with suspended particulates therein, said apparatus including a robotic arm controlled by programmable microprocessor means for guiding a sampling probe depending from an outer end portion of said robotic arm, the improvement to said apparatus wherein samples are discretely retrieved from a plurality of such vessels by a single sampling probe having a single in-line filter therein, said probe comprising
an hypodermic needle at a lower end of said probe for withdrawing sample from said vessel,
a single filter member downstream said needle and communicating therewith for filtering said particulates from said withdrawn sample to provide filtered sample,
connecting means downstream said filter member for locking said filter member into fixed position in said probe

while permitting communication between said filter member and said connecting means,

tubing means in communicating relationship with said connecting means, said tubing means connected externally said probe to reversible pump means controlled by said programmable microprocessor, said pump means causing said formulation to be withdrawm through said needle and filter member to provide said filtered sample downstream said filter member to be stored in said tubing means, and



said particulates to be retained upstream said filter member, said pump means being programmed to cause said filtered sample to reverse its direction of flow to dislodge said retained particulates back into said vessel,

other means for dispensing said filtered sample stored in said tubing means into a sample container, and

additional means for cleaning said probe prior to insertion of said probe into another vessel for retrieving samples therefrom.

4,594,903

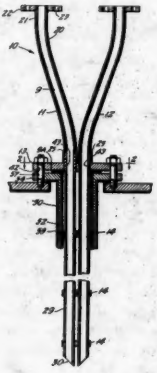
DIP TUBE SAMPLING MEANS FOR CHEMICAL REACTORS

Kirk B. Johnson, Howard, Pa., assignor to Ethylene Corp, Murray Hill, N.J.

Filed Nov. 19, 1984, Ser. No. 672,921

Int. Cl.[4] G01N *1/14*

U.S. Cl. 73—863.83 **4 Claims**



1. An improved dip tube adapter for use in sampling reacting material in a vessel comprising: first and second tube elements and a flange element supporting said tube elements at a medial point thereon; said tube elements being disposed in mutually parallel relation and passing through said flange element; that part of said first and second tube elements on one side of said flange element being formed of steel reinforced PTFE tubing; that part of said first and second tube elements on the opposite side of said flange element being formed of unreinforced PTFE tubing; said flange element having means for engaging a corresponding flange on a dip tube, whereby said second mentioned parts of said first and second tubes are positioned within said dip tube to be protected thereby.

4,594,904

SAMPLING VALVE FOR A FIXED BED REACTOR COAL GASIFICATION PLANT

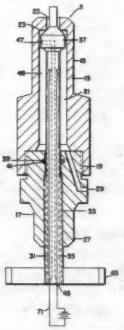
Artur Richter, Mülheim, Fed. Rep. of Germany, assignor to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,104

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322798

Int. Cl.[4] G01N *1/22*

U.S. Cl. 73—863.86 **7 Claims**



1. An improved sampling valve for use in a fixed bed reactor coal gasification process comprising: a valve housing defining a first valve chamber and a second valve chamber, said first valve chamber with a first opening at one end thereof through which a sample of a constituent of interest enters said first valve chamber and a second opening remote from said first opening through which said sample is removed from said first valve chamber; a valve stem means operatively associated with said valve housing for selectively opening and closing said first valve chamber opening, said valve stem means including a valve shutter means at one end thereof which cooperates with said first opening and a generally axial bore extending from the other end of said valve stem means to said shutter means an in communication with said first valve chamber through said shutter means, said valve housing also defining said second chamber through which said valve stem means passes and third and fourth, second chamber openings through which a medium can be introduced into said second chamber and removed therefrom, said valve housing including seal means operatively disposed therein to isolate said first valve chamber from said second valve chamber, wherein a first medium can be introduced into said first valve chamber when said first opening is closed by means of said valve stem means bore and said first medium can be removed from said first valve chamber through said second opening, and wherein a second medium can be introduced into said second chamber and removed therefrom via said third and fourth second chamber openings.

4,594,905

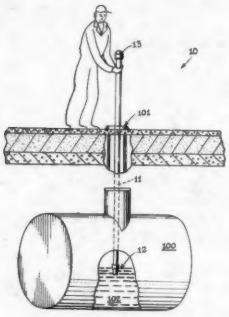
LIQUID ANALYZER

Ronald B. Roberts, c/o Southeastern Liquid Analyzers, 300 W. Liberty St., P.O. Box 754, York, S.C. 29745

Continuation-in-part of Ser. No. 430,936, Sep. 8, 1983, abandoned. This application Nov. 21, 1984, Ser. No. 673,698

Int. Cl.[4] G01F *23/04*

U.S. Cl. 73—864.63 2 Claims



1. An improved liquid analyzer for use in combination with a fuel storage container to check the temperature, level, content, and condition of fuel inventories, wherein the apparatus comprises:

an elongated tubular unit comprising an elongated clear hollow rigid tubular element having gradations indicative of length imprinted on its surface;

a closure unit disposed on the bottom of said rigid tubular element and comprising a cylindrical closure element provided with at least one o-ring disposed around its periphery, and further comprising a hollow generally cylindrical closure seating element fixedly secured to the bottom of said tubular element, wherein said closure seating element has a reduced diameter portion that forms an internal and external stepped shoulder, and the internal stepped shoulder acts both as a seat for the closure element as well as a portion of a closure travel limit means, wherein the reduced diameter portion of the closure seating element is dimensioned to be received within the bottom of said tubular element, and the external stepped shoulder abutts the bottom of said tubular element;

a plurality of elongated fluid apertures disposed around the periphery of said closure seating element which permit the ingress and egress of liquid into said tubular element;

a closure actuating unit comprising an elongated rigid rod member slidingly received in a centrally disposed aperture in a cap element which is secured to the top of said tubular element, wherein said elongated rigid rod member is secured on one end to the closure element, and provided on its other end with an actuating knob;

a guiding unit comprising a plurality of slim profile multi-arm apertured guide members slidingly disposed on the elongated rigid rod member;

a closure travel limit means comprising a horizontally disposed bar member connected to the lower portion of the actuator rod, and dimensioned to engage the top of the reduced diameter portion of the closure seating element; and,

a temperature indicating unit comprising at least one thermometer slidingly disposed on said actuator rod, whereby said temperature indicating unit may be selectively positioned at a point below the liquid level of a reservoir.

4,594,906

POWER TAKE-OFF MECHANISMS

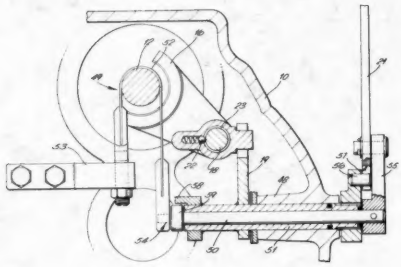
Martin P. Vincent, 1 Pennine Close, Upperthon, Holmfirth, Huddersfield West Yorkshire, and Roger M. Weyman, Alverley Lodge Farm, Alverley, Doncaster, South Yorkshire, both of England

Filed Mar. 1, 1984, Ser. No. 585,482

Claims priority, application United Kingdom, Mar. 3, 1983, 8305935

Int. Cl.[4] F16H *37/00, 57/10;* F16D *67/02*

U.S. Cl. 74—15.4 11 Claims



1. A power take-off mechanism comprising a power input shaft driveable from an engine by a friction clutch at one end of said shaft, a two-speed power take-off shaft driveable by gearing which includes disengageable toothed driving means and is disposed at the other end of the input shaft, a control lever for operating the disengageable toothed driving means by way of a selector fork, and a brake for the input shaft applied by initial movement of the control lever out of disengaged position in a direction to engage the disengageable toothed driving means and then held temporarily applied as long as an operating load continues to be exerted on said lever in said direction to effect engagement of the disengageable toothed driving means.

4,594,907

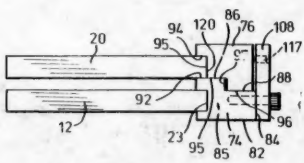
RECIPROCATING MACHINE COMPONENT

Barry C. Millar, 33 Burnhamthorpe Park Blvd., Islington, Ontario, Canada, and Keith W. Little, 7 Dan Ridge Crescent, Georgetown, Ontario, Canada

Filed Sep. 26, 1984, Ser. No. 654,480

Int. Cl.[4] F16H *21/44;* F16C *5/00*

U.S. Cl. 74—105 9 Claims



1. A machine component comprising:

an elongated base plate with side edges,

a linear actuator assembly having two parts which can move away from and toward each other,

first mounting means on said base plate, said mounting means supporting one part of said assembly,

a slide plate rectangular in cross-section and having parallel straight side edges, two elongated guide members each having a rectangular slot adapted to slidingly receive the edge of the slide plate, each elongated guide member including a lower part and an upper part and means for

securing them together, the lower part having means for attachment to the base plate, said rectangular slot having (1) a first side wall adjacent to and parallel with the base plate, said first side wall being defined by a surface of said lower part, (2) a second side wall defined by a surface of said upper part, and (3) a bottom wall defined by a surface of one of said upper and lower parts, the upper and lower parts having oblique mating surfaces such that longitudinal meovement of one part with respect to the other causes the parts to separate from or approach each other in a manner to change the width of said slot,

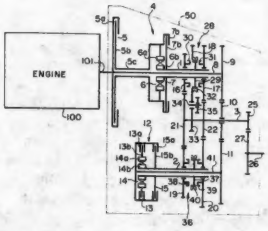
and second mounting means establishing a connection between the slide plate and the other part of said assembly.

4,594,908

TRANSMISSION WITH TWO PARALLEL DRIVING SHAFTS BEARING TWO DRIVING GEARS EACH MESHED WITH SAME DRIVEN GEAR ON PARALLEL DRIVEN SHAFT

Teruo Akashi; Hiroshi Ito, and Shigemichi Yamada, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 28, 1983, Ser. No. 470,382
Claims priority, application Japan, Jun. 18, 1982, 57-104732
Int. Cl.[4] F16H *3/10*
U.S. Cl. 74—359 **6 Claims**



1. A transmission mechanism for a vehicle, for receiving input of rotational power from a power supplying member which rotates in a particular rotational direction and for outputting rotational power to a power receiving member, comprising:

an input member connected to said power supply member and which is rotatably mounted and receives supplying of said rotational power from said power supply member;

a first driving gear wheel shaft;

a second driving gear wheel shaft mounted generally parallel to said first driving gear wheel shaft;

a driven gear wheel shaft mounted generally parallel to said first and second driving gear wheel shafts, said driven gear wheel shaft being rotationally connected to said power receiving member;

a first driven gear wheel fixedly mounted on said driven gear wheel shaft;

a first driving gear wheel which is rotatably mounted on said first driving gear wheel shaft and is in constant mesh with said driven gear wheel, said first driving and driven gear wheels providing a first reduction gear ratio from said first driving gear wheel shaft to said driven gear wheel shaft;

a second driven gear wheel fixedly mounted on said driven gear wheel shaft;

a second driving gear wheel which is rotatably mounted on said second driving gear wheel shaft and is in constant mesh with said first driven gear wheel, said second driving and said first driven gear wheels providing a second reduction gear ratio smaller than said first reduction gear ratio from said second driving gear wheel shaft to said driven gear wheel shaft;

a third driving gear wheel which is rotatably mounted on said first driving gear wheel shaft and is in constant mesh with said second driven gear wheel, said third driving and said second driven gear wheels providing a third reduction gear ratio smaller than said second reduction gear ratio from said first driving gear wheel shaft to said driven gear wheel shaft;

a fourth driving gear wheel which is rotatably mounted on said second driving gear wheel shaft and is in constant mesh with said second driven gear wheel, said fourth driving and said second driven gear wheel providing a fourth reduction gear ratio smaller than said third reduction gear ratio from said second driving gear wheel shaft to said driven gear shaft;

a first synchromesh device which engages said first driving gear wheel with said first driving gear wheel shaft when said first synchromesh device is shifted to one side of a neutral position thereof and which engages said third driving gear wheel with said first driving gear wheel shaft when said first synchromesh device is shifted to the other side of said neutral position thereof opposite to said one side;

a second synchromesh device which engages said second driving gear wheel with said second driving gear wheel shaft when said second synchromesh device is shifted to one side of a neutral position thereof and which engages said fourth driving gear wheel with said second driving gear wheel shaft when said second synchromesh device is shifted to the other side of said neutral position thereof opposite of said one side;

a first clutching device comprising a rotational power input member and a rotational power output member, mounted proximate to one end of said first driving gear wheel shaft with its rotational power output member rotationally coupled to said first driving gear wheel shaft, which according to selective control thereof is able to selectively couple said first driving gear wheel shaft to said input member in either relative rotational direction, and couple said first driving gear wheel shaft to said input member in a first relative rotational direction only, said first relative rotational direction being a direction in which rotational power is required to be transmitted through said first clutching device in order to rotationally power said first driving gear wheel shaft from said power supplying member via said input member and said first clutching device when said power supplying member is being rotated in said particular rotational direction; and

a second clutching device comprising a rotational power input member and a rotational power output member, mounted proximate to the one end of said second driving gear wheel shaft with its rotational power output member rotationally coupled to said second driving gear wheel shaft, which according to selective control thereof is able to selectively couple said second driving gear wheel shaft to said input member in either relative rotational direction, and couple said second driving gear wheel shaft to said input member in a second relative rotational direction only, said second relative rotational direction being a direction in which rotational power is required to be transmitted through said second clutching device in order to rotationally power said second driving gear wheel shaft from said power supplying member via said input member and said second clutching device when said power supplying member is being rotated in said particular rotational direction wherein one of said rotational power input members of said first and second clutching devices is coaxially rotationally coupled to said input member; and

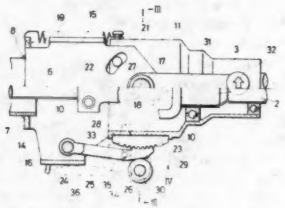
rotational power transfer means including a first power transfer gear wheel coaxially rotationally coupled to said one of said rotational power input members of said first and second clutching devices, a second power transfer gear wheel coaxially rotationally coupled to the other of said rotational power input members of said first and second clutching devices, and an intermediate power transfer gear wheel rotatably mounted on said driven gear

wheel shaft and meshed with said first and second power transfer gear wheels.

4,594,909
TILTABLE STEERING MECHANISM

Mikio Yamaguchi, Takasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,618
Claims priority, application Japan, Mar. 7, 1984, 59-31648[U]
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—493 **19 Claims**



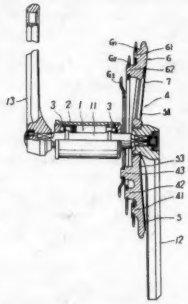
1. A tiltable steering mechanism having:
a support portion for rotatably supporting a steering shaft on which a steering wheel is mounted;
a fixed portion fixed to a vehicle body and supporting said support portion tiltably about a tilt axis;
a pair of tilt fulcrum forming members defining the tilt axis;
an engaging portion provided on one of said support portions and said fixed portion and positioned at the intermediate portion between the two tilt fulcrum forming members;
a restraining member mounted on the other of said support portion and said fixed portion for movement between an engaged position and a disengaged position and engageable with said engaging portion at said engaged position to fix said support portion to said fixed portion at a selected tilt angle and disengageable from said engaging portion at a selected tilt angle and disengageable from said engaging portion at said disengaged position to render said support portion tiltable relative to said fixed portion;
holding means provided so as to be capable of assuming a holding position and a non-holding position and capable of holding said restraining member when said holding means assumes said holding position and causing said restraining member to assume said disengaged position when said holding means assumes said non-holding position; and
an operating member for causing said holding means to selectively assume said holding position and said non-holding position;
wherein said holding means has a pair of pivotable support hangers and shaft means extended between the free ends of said support hangers, said shaft means being adapted to bear against said restraining member in said holding position to thereby hold the same in said engaged position and to be disengaged from said restraining member in said non-holding position.

4,594,910
GEAR CRANK FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 9, 1984, Ser. No. 629,114
Claims priority, application Japan, Jul. 11. 1983, 58-108203[U]
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.2 **4 Claims**

1. A gear crank comprising a plurality of chain gears and a crank having a crank shaft and a pair of crank arms, said chain gears being mounted to a plurality of stay members disposed radially outwardly with respect to said crank shaft, said stay members comprising four main stays which are arranged in first and second pairs, each pair including two main stays, each main stay being disposed at a phase difference of about 180° relative to a respective main stay of the other pair, said pairs being disposed symmetrically relative to each other around said crank shaft, each main stay having a mounting portion for each of said chain gears; said stay members further comprising two auxiliary stays each disposed between said pairs of said main stays on radially opposite sides relative to said crank shaft and having mounting portions for at least a largest diameter

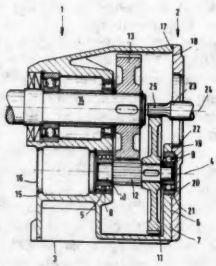


chain gear of said chain gears; the two main stays in each said pair of main stays intersecting at a non-90° angle such that an angle between said pairs of main stays is larger than an angle between said two main stays forming each said pair, said crank arms being disposed between said pairs of main stays within a region defined by said larger angle on radially opposite sides relative to said crank shaft, said gear crank further comprising connecting segments for supporting said auxiliary stays and extending circumferentially of said chain gear, each connecting segment being disposed between a said auxiliary stay and a said main stay adjacent thereto.

4,594,911
GEAR HOUSING

Edwin Hofmann, Bad Oldesloe, Fed. Rep. of Germany, assignor to Getriebelbau-Nord Schlicht & Kuchenmeiser GmbH & Co, Bargteheide, Fed. Rep. of Germany

Continuation of Ser. No. 649,543, Sep. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 382,089, May 26, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 774,382
Int. Cl.[4] F16H *57/02*
U.S. Cl. 74—606 R **4 Claims**



1. A gear assembly comprising:
a housing having an assembly orifice,
a cover for closing said orifice,

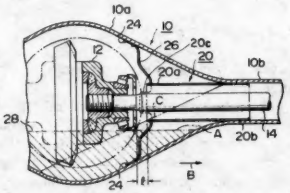
a gear shaft journalled in said housing,
a gear wheel mounted on said gear shaft for rotation therewith,
a first bearing for said gear shaft located in said housing at one end of said gear shaft between said gear wheel and said cover,
a second bearing for said gear shaft located in said housing at the other end of said gear shaft,
said cover having a first bore extending therethrough,
a cover shaft of a motor mounted to said cover substantially centered in relationship to said first bore in said cover and arranged to project therethrough into said housing,
a pinion supported by said cover shaft and positioned in said housing for interacting with said gear wheel, and
locating means for securing the exact distance between said gear shaft and said cover shaft,
said locating means comprising a pair of surfaces of revolution concentric to said first bearing which axially align with said first bearing when said cover is mounted on said housing and covering said assembly orifice,
said pair of surfaces of revolution comprising a periphery of said first bearing and a mating surface, said mating surface mating with said periphery and formed in said cover.

4,594,912

BANJO TYPE AXLE CASING

Masakazu Ishikawa, Toyoake, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 8, 1980, Ser. No. 166,785
Claims priority, application Japan, Jul. 19, 1979, 54-92394
Int. Cl.[4] F16H *57/02*
U.S. Cl. 74—607 **10 Claims**



1. A banjo type axle casing comprising:
an enlarged center case portion for housing a differential gear,
a pair of sleeve-like case portions outwardly extending from opposite ends of said center case portion for housing an axle shaft,
a pair of oil deflectors for preventing oil from flowing away from said differential gear into said sleeve-like case portions,
said oil deflectors each comprising a thin rectangular sheet free of cuts or fissures shaped into a cylinder having axially extending overlapping portions, a single-point spot weld on said overlapping portions restraining only an inner end of said cylinder from expanding, said restrained inner end being spaced from said differential gear, and an unrestrained outer end of said cylinder in contact with and freely radially deformable along an inner peripheral surface of one of said sleeve-like case portions.

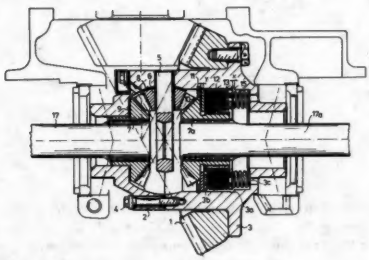
10. A banjo type axle casing comprising:
an enlarged center case portion for housing a differential gear,
a pair of sleeve-like case portions outwardly extending from opposite ends of said center case portion for housing an axle shaft,
a pair of oil deflectors for preventing oil from flowing away from said differential gear into said sleeve-like case portions,
said oil deflectors each comprising a thin sheet shaped into a cylinder having axially extending overlapping portions, a single-point spot weld on said overlapping portions restraining only an inner end of said cylinder from expanding, said restrained inner end being spaced from said differential gear, and an unrestrained outer end of said cylinder in contact with and freely radially deformable along an inner peripheral surface of one of said sleeve-like case portions;
wherein the restrained end of said oil deflector is solidly secured to a resiliently deformable claw member and said claw member is engaged with set plates provided on the inner peripheral surface of said center case portion.

4,594,913

DOUBLE-ACTING DIFFERENTIAL WITH SLIP LIMITING ELEMENTS

Andor Opitz, Gyor, Hungary, assignor to Magyar Vagon- es Gepgyar, Gyor, Hungary

Filed Feb. 17, 1984, Ser. No. 581,319
Claims priority, application Hungary, Nov. 14, 1983, 3887/83
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—711 **2 Claims**



1. A double acting differential gear having slip-limiting means, comprising: a differential case having an internal spherical wall and two differential case halves having a common axis of rotation, coupling elements holding said halves together, one case half having a flange, driving gear means fixed to said one, flanged differential case half, a differential cross between said two case halves, differential pinions rotatably mounted in said differential cross, a spherical thrust plate inhibiting axial displacement of said differential pinions and bearing against said internal spherical wall of said differential case, two differential side gears arranged at the axis of rotation of said differential case and engaged with teeth of said differential pinions, said side gears having internal ribs engaged with external ribs of two driving shafts for torque transmission, one of said side gears having a rear side bearing against the inner wall of said differential case half through a thrust plate for the axial support of said side gear, said other differential side gear being arranged in said flanged differential case and having a rear side supported by an axially movable thrust plate, externally and internally ribbed discs arranged between said thrust plate and said flange, said externally ribbed discs being engaged with internal ribs of said flanged differential case half for torque transmission, said internally ribbed discs being engaged with the external ribs of said side gear for torque transmission, pressure springs arranged between said discs and said flange and pressing said discs against said thrust plate, the arrangement being such that, when the force of said pressure springs is greater than the axial force reacting on said side gear, said pressure springs press said thrust plate through said discs against a snap ring in a groove of said flanged differential case half, to thereby ensure tooth clearance between the teeth of said side gear; and when the force of said pressure springs is less than the axial force reacting to said side gear, said side gear presses the discs through said thrust plate against said flange; and a shoulder at a front of said internal ribs of said flanged differential case, said shoulder in case of failure of said discs

preventing the thrust plate from axial displacement to an extent which would result in increased, harmful tooth clearance in said side gears.

4,594,914

TRANSVERSE TYPE AUTOMATIC TRANSMISSION WITH INTERMEDIATE POWER TRANSFER THROUGH LAY SHAFT

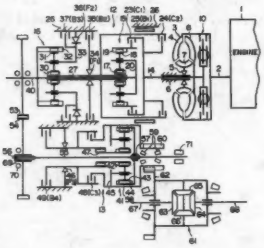
Seitoku Kubo, Toyota; Kunio Morisawa, Okazaki, and Masakatsu Miura, Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin-Warner Limited, both of, Japan

Filed Sep. 28, 1982, Ser. No. 425,257

Claims priority, application Japan, Nov. 11, 1981, 56-180793

Int. Cl.[4] F16H *47/00, 37/08, 37/06, 37/00*

U.S. Cl. 74—730 5 Claims



1. An automatic transmission for an automotive vehicle, comprising:

a. a fluid torque converter, comprising a converter rotational power input member and a converter rotational power output member, said converter rotational power input member and said converter rotational power output member both being rotatable about a first axial line;

b. a first gear transmission mechanism, comprising a first transmission rotational power input member and a first transmission rotational power output member, and being adapted to be selectively controlled to produce any one of a plurality of speed ratios between said first transmission rotational power input member and said first transmission rotational power output member, said first transmission rotational power input member and said first transmission rotational power output member both being rotatable about said first axial line; said first transmission rotational power input member being rotationally coupled with said converter rotational power output member;

c. a through lay shaft which extends along and is rotatable about a second axial line parallel to said first axial line and displaced laterally therefrom;

d. a second gear transmission mechanism supported by said through lay shaft to be rotatable about said second axial line, comprising a second transmission rotational power input member and a second transmission rotational power output member, and being adapted to be selectively controlled to produce any one of a plurality of speed ratios between said second transmission rotational power input member and said second transmission rotational power output member, said second transmission rotational power input member being rotationally coupled with said through lay shaft and said second transmission rotational power output member being rotatable about and relative to said through lay shaft;

e. a rotational power transfer mechanism for transferring rotational power between said first transmission rotational power output member and said through lay shaft, including a first rotational member rotatable about said first axial line and rotationally coupled with said first transmission rotational power output member and a second rotational member rotatable about said second axial line and supported by and rotationally coupled with said through lay shaft; and

f. a power output gear wheel rotatable about said second axial line and rotatably supported by said through lay shaft and rotationally coupled with said second transmission rotational power output member.

4,594,915

CYCLOID TRANSMISSION ASSEMBLY

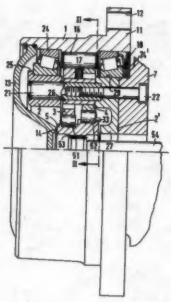
Rudolf Braren, Conollystr.26, D-8000 München 40, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,827

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206992

Int. Cl.[4] F16H *1/32*

U.S. Cl. 74—805 13 Claims



1. A cycloid transmission comprising:

an outer ring member;

shaft means disposed in the ring member;

at least first and second eccentrics on said shaft means;

a plurality of cycloid discs co-operable with respective ones of said eccentrics and having bores extending therethrough, said shaft means being mounted floatingly in the bores defined by said cycloid discs and held in a mounting condition of balance and equilibrium by reaction forces transmitted from the cycloid discs to the eccentrics on said shaft means, each of said cycloid discs having raised portions formed by a closed cycloid curve and operatively engaging with said ring member;

respective power transmitting discs disposed at the sides of the cycloid discs;

power transmitting pins extending through respective openings in the cycloid discs and having first and second end portions supported in said power transmitting discs; and

bearing means at the outer periphery of the power transmitting discs for supporting the ring member.

4,594,916

METHOD FOR CONTROLLING AN ENGINE INSTALLED WITH CONTINUOUSLY VARIABLE TRANSMISSION

Hiroshi Ito, Toyota; Shigeki Hiramatsu, Okazaki, and Mitsuru Takada, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jan. 30, 1984, Ser. No. 574,737

Claims priority, application Japan, Feb. 7, 1983, 58-17550

Int. Cl.[4] B60K *41/16*

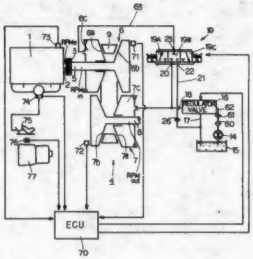
U.S. Cl. 74—866 16 Claims

10. A method for controlling an actual engine speed in a motor vehicle comprising a continuously variable transmission, the transmission having a driving pulley comprising a fixed member and a movable member, the movable member being actuated by a hydraulic cylinder to form a V-shaped opening between the movable member and the fixed member,

a driven pulley with another fixed member and another movable member, the another movable member being actuated by another hydraulic cylinder to form another V-shaped opening between the another movable member and the another fixed member, a flexible belt member spanning the pulleys, and an electronic control means, the electronic control means includes a memory means for storing a relationship between a plurality of desired engine speeds and throttle openings, said electronic control means for controlling pressure in the hydraulic cylinders according to an optimal desired engine speed of the engine, the method comprising the steps of:

detecting first and second amounts of a throttle opening, the first amount of the throttle opening detected being an initial amount before a change in the throttle opening, the second amount of the throttle opening being an amount after the change in the throttle opening;

determining a first desired engine speed for steady state conditions before said change in the throttle opening and determining a second desired engine speed for steady state conditions after said change in the throttle opening, said



first desired engine speed being determined from said detected first amount of said throttle opening in accordance with said relationship stored in said memory means, said second desired engine speed being determined from the detected second amount of said throttle opening in accordance with said relationship stored in said memory means;

calculating a difference between said first desired engine speed and said second desired engine speed;

comparing said difference between said first desired engine speed and said second desired engine speed with a predetermined value;

adjusting said actual engine speed in accordance with said comparison, whereby when said difference is smaller than said predetermined value, said actual engine speed is adjusted to approach said second desired engine speed gradually, and when said difference is larger than said predetermined value, said actual engine speed is immediately adjusted to a transient value and then is adjusted to approach said second desired engine speed gradually.

4,594,917

CRANK ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

Gerhard Ziegler, Besigheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Continuation of Ser. No. 434,372, Oct. 14, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 680,606

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3140951

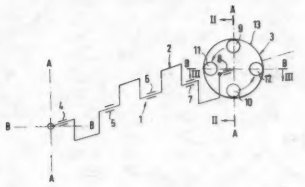
Int. Cl.[4] G05G *1/00*

U.S. Cl. 74—572 **12 Claims**

12. Apparatus for minimizing flexural vibrations at the crank drive of an internal combustion engine having a flywheel with a crankshaft having a crank plane and a second plane substantially normal to the crank plane and a crankshaft axis lying in both the crank and normal planes, comprising

means for establishing a first resonant frequency in substantially the crank plane, and

means for estabiishing a second resonant frequency in substantially the normal plane, said second resonant frequency being different from the first resonant frequency,



wherein the means for establishing a second resonant frequency comprises

plural added masses each located substantially on opposite sides of the crankshaft axis in the normal plane and substantially equidistant therefrom.

4,594,918

WRIST MECHANISM FOR INDUSTRIAL ROBOT

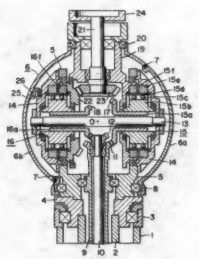
Karou Kimura, and Junichiro Ogawa, both of Kitakyushu, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Kitakyushu, Japan

Filed Jul. 20, 1984, Ser. No. 632,801

Claims priority, application Japan, Dec. 22, 1983, 58-242696

Int. Cl.[4] F16H *37/00*

U.S. Cl. 74—665 A **1 Claim**



1. In a wrist mechanism for an industrial robot in which a tool is mounted at the end of an arm through the wrist mechanism, and in which the wrist mechanism comprises:

a first input shaft rotating at a reduced speed for rotating the whole wrist;

a second input shaft for tilting a wrist portion;

a third input shaft for rotating the tool; said first, second, and third input shafts being mounted within the arm and the axes thereof being aligned in the same shaft axis line;

a wrist cover which is generally of a spherical shape and is divided into two parts by a divisional plane which forms an oblique angle with said input shaft axes, said parts being rotatable relative to the divisional plane, one of the parts of the divided wrist cover being rotatably mounted on a wrist seat and the other part of the divided wrist cover having a tilting shaft and a tool rotation shaft mounted thereon;

a speed reduction shaft journaled at opposite ends thereof by a pair of brackets disposed facing each other and one of each of the parts of the wrist cover, said speed reduction shaft being perpendicular to said input shaft axes and coupled to said first input shaft;

differential speed reduction devices mounted about opposite ends of said speed reduction shaft respectively; and

said tilting shaft for the wrist mechanism and the tool rotation shaft being aligned in the same shaft axis line passing through an intersecting point between the axes of said input shafts and said speed reduction shaft; and said speed reduction shaft, differential speed reduction devices, tilting shaft, and rotation shaft being mounted within said wrist cover,

a guide protrusion provided on the side of the bracket facing said other part of the divided wrist cover; and

a guide provided on the inner face of said other part of the divided wrist cover at a point on a locus of the path of said guide protrusion relative to said other part of the wrist cover so as to engage said guide protrusion to prevent relative free rotation between the wrist cover parts, said point being defined so that at least the axes of said tool rotation shaft and input shafts coincide with each other.

4,594,919

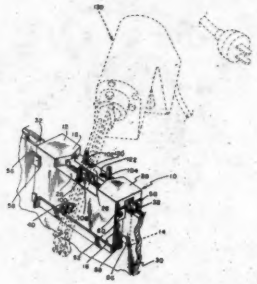
SHARPENING OF CHAIN SAWS

Albert A. Southard, R.R. #3, Council Grove, Kans. 66846

Continuation-in-part of Ser. No. 341,771, Jan. 22, 1982, Pat. No. 4,429,596. This application Nov. 18, 1983, Ser. No. 553,053

Int. Cl.⁴ B23D *63/10, 63/16*

U.S. Cl. 76—36 **9 Claims**



1. In chain saw sharpening apparatus, an elongated frame having front and rear ends, an elongated file of integral construction having first and second end portions and an intermediate extent that includes integral inflexible teeth that define a cutting surface of generally cylindrical configuration, a forward mounting means adjacent the front end of the frame for detachably and rotatably mounting the first end of the file on the frame, a rear means adjacent the rear end of the frame for detachably and rotatably connecting the frame to the file adjacent the second end of the latter, said frame having a projection adjacent its front end adapted for manual engagement by the user when manipulating the frame with the file rotating, said frame and file being so constructed and arranged so that the intermediate extent of the file is unobstructed radially by the frame in one lateral direction from the latter, said forward mounting means comprising said frame having an internally threaded opening therethrough at its front end that is axially aligned with the file, an externally threaded bearing adjustably threaded in said opening, and said bearing having an axial opening within which the first end portion of the file is journaled for rotation.

4,594,920

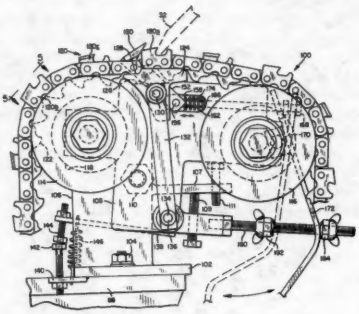
GRINDING MACHINE FOR GRINDING CUTTER IN CUTTER LINKS

Lynn J. Ziegelmeyer, 113 Cottage, Apt. 2A, Medford, Oreg. 97501

Filed Oct. 29, 1984, Ser. No. 665,780

Int. Cl.⁴ B23D *63/16*

U.S. Cl. 76—42 **11 Claims**



1. In a grinding machine for grinding the cutter of a cutter link in saw chain, the link including a gullet disposed forwardly of the cutter, the machine including a power-driven grinding wheel of grinding the cutter, the improvement comprising:

a saw chain support for supporting a portion of saw chain which includes a cutter link during grinding of the cutter in the link, with the cutter of the link projecting outwardly from the support, a mounting for the support defining a path of movement for the support which extends generally longitudinally of the link held by the support,

a cam-acting chain positioner engageable with the rear and top of the cutter of the cutter link supported by said support, means for moving the positioner whereby such moves the link it has engaged in a direction extending longitudinally of the link with the link moving forwardly while supported on the support,

said positioner during such movement camming the rear of the link against the support and said support by reason of the camming moving along with the link.

4,594,921

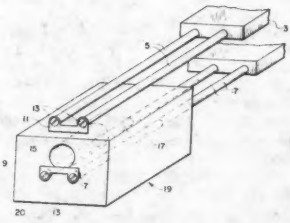
CABLE STRIPPING APPARATUS

John Ishmael, Chino, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1985, Ser. No. 763,860

Int. Cl.⁴ H02G *1/12*

U.S. Cl. 81—9.4 **6 Claims**



1. A tool for facilitating the removal of accurate lengths of plastic outer insulation from the ends of electrical cables, com-

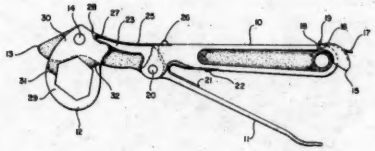
prising: a first jig comprising a block made from electrically and thermally insulating material, said first jig comprising a gauging hole, a thermal stripper having upper and lower heating elements located at the ends of upper and lower arms, said lower arms projecting through holes in said block with said lower heating element located adjacent to and overlapping the mouth of said gauging hole by the approximate thickness of said plastic insulation to be removed, said upper arms extending over the top of said block and said upper heating element being capable of overlapping the mouth of said gauging hole on the opposite side thereof from said first heating element, whereby a length of said cable to be stripped may be inserted into said hole and rotated to produce an accurate circumferential cut therein, said tool further comprising a second jig which may be sequentially attached to said thermal stripper to provide a pair of diametrically opposed longitudinal cuts in said outer insulation between said circumferential cut and the adjacent end of said cable, said second jig comprising a block of electrically and thermally insulating material with a V-shaped groove therein, said lower heating element located along the bottom of said groove and projecting upward into said groove sufficiently so that said lower heating element can make a first longitudinal cut in said outer insulation when said cable is inserted into said groove, and said upper heating element is arranged above said groove and said cable to simultaneously provide a second longitudinal cut diametrically opposite to said first cut when said upper arms and heating element are pressed down on said cable.

4,594,922

CLOSED END JAW WRENCH

Sea C. Park, and In P. Park, both of 3836 Birchwood, Skokie, Ill. 60076

Filed Mar. 22, 1985, Ser. No. 715,161
Int. Cl.[4] B25B *13/28*
U.S. Cl. 81—99 **3 Claims**



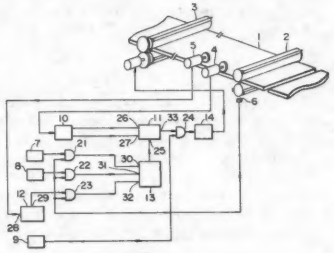
1. A closed end jaw wrench comprising:
a body member having an upper jaw disposed at one end thereof,
a handle member pivotally connected to said body member,
a lock attached to said body member, whereby said handle member can be locked to the body member,
a closed end jaw member having a hexagon configuration pivotally connected to said body member,
biasing spring disposed between said body member and said handle member for biasing the handle member away from the body member, the handle member containing a lever engaging end portion which engages the base engaging surface of the closed end jaw for separating the upper jaw of the body member from the closed end jaw by releasing of the handle and permitting the biased spring to separate the handle from the body, and
a retaining spring is attached at one end to said body and at the other end to a protrusion portion of the surface of the closed end jaw, whereby, when the handle is squeezed, the upper jaw of the body member is caused to close toward the closed end jaw against the action of the retaining spring.

4,594,923

CONTROLLER FOR CUTTING SHEET MATERIAL

Akihisa Fujita, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 30, 1985, Ser. No. 728,707
Claims priority, application Japan, May 2, 1984, 59-89024
Int. Cl.[4] B26D *5/26*
U.S. Cl. 83—74 **11 Claims**



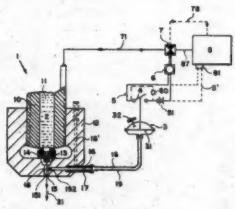
1. A controller for cutting sheet material so that inferior sheet material is eliminated, comprising means for detecting a length of sheet passing through a rotary cutter, means for detecting a velocity v of the sheet, means for detecting completion of cutting operation of the rotary cutter, means for calculating a length f(v) of the sheet moving until a velocity of a cutting edge of a shear is equal to a velocity of the sheet after the shear has been started on the basis of the velocity of the shear, delay time setting means for calculating a delay time x at the starting of the shear so that a cut portion of sheet first cut by the shear coincides with a cut portion of sheet by the rotary cutter, and timing control means for controlling a start timing of the sheet on the basis of an output of said setting means.

4,594,924

LIQUID JET CUTTING APPARATUS

Franz Windisch, Kapfenberg, Austria, assignor to Vereinigte Edelstahlwerke Aktiengesellschaft, Vienna, Austria

Filed Apr. 15, 1985, Ser. No. 723,564
Claims priority, application Austria, Apr. 25, 1984, 1367/84
Int. Cl.[4] B26F *3/00*
U.S. Cl. 83—177 **20 Claims**



1. A liquid jet cutting apparatus comprising:
a high-pressure installation for pressurizing a liquid cutting medium to a predetermined high pressure;
a cutter head;
supply lines connecting said high-pressure installation and said cutter head and supplying said pressurized liquid cutting medium from said high-pressure installation to said cutter head;
said cutter head containing a housing provided with a jet exit opening from which, during a cutting operation, there exits a liquid cutting jet formed by said pressurized liquid cutting medium;

control means for controlling the supply of said pressurized liquid cutting medium to said jet exit opening;

wall means defining a jet discharge passage and a gas space through which flows said liquid cutting jet formed by the pressurized liquid cutting medium;

a pressure sensor connected to said gas space defined by said wall means and provided with means for adjustment of said pressure sensor to a predetermined pressure threshold value;

said pressure sensor being responsive to the pressure prevailing in said gas space defined by said wall means;

a transmitter operatively associated with said pressure sensor;

warning means; and

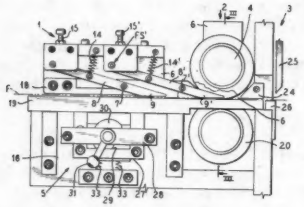
said transmitter operatively associated with said pressure sensor being operatively connected to said warning means and activating said warning means whenever said pressure prevailing in said gas space rises above or drops below said predetermined pressure threshold value to which said pressure sensor is adjusted, in order to thereby indicate an undesirable condition of said liquid cutting jet formed by said pressurized liquid cutting medium.

4,594,925

APPARATUS FOR CUTTING A SLIDE FASTENER CHAIN

Kiichiro Ishikawa, Marietta, Ga., assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 14, 1984, Ser. No. 671,224
Int. Cl.[4] B26D *5/28*
U.S. Cl. 83—209 **11 Claims**



1. An apparatus for cutting a continuous slide fastener into individual slide fastener lengths, the fastener having successive longitudinally spaced groups of coupling elements mounted on a stringer tape and element-free gap sections between the successive coupling element groups, said apparatus comprising:

a frame having a guide table for supporting the fastener thereon;

means for moving the fastener along a longitudinal path over said guide table in a predetermined direction to a cutting station, said moving means being operable to move the fastener at a rate varying from a high speed to a low speed;

a detecting station adjacent said cutting station and containing means for detecting when a leading end of one of said successive coupling element groups is in a position in said detecting station fully upstream of said cutting station and for rendering, in response to said detection, said moving means operative to move the fastener at a lower rate until a preceding element-free gap section contiguous to the leading end of said coupling element group arrives in said cutting station and a support means having at least part of said detecting means attached thereto overlying said guide table and adapted for being selectively raised relative to said guide table to permit thread-up of said fastener thereon prior to activation of said moving means;

means for deenergizing, upon said arrival of said preceding element-free gap section in said cutting station, said moving means to terminate the movement of the fastener; and

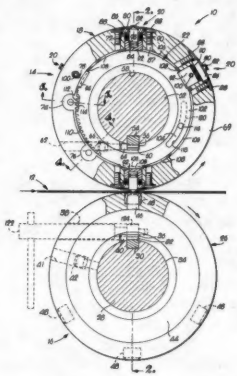
a cutter blade means disposed in said cutting station for severing the fastener transversely across said preceding element-free gap section in response to termination of the movement of the fastener.

4,594,926

FILE HOLE PUNCH RING APPARATUS FOR WEB FED PAPER CONVEYING MECHANISM

Howard L. Propheter, Emporia, Kans., assignor to Didde Graphic Systems Corporation, Emporia, Kans.

Filed Oct. 24, 1983, Ser. No. 544,528
Int. Cl.[4] B26D *1/62*
U.S. Cl. 83—345 **12 Claims**



1. Apparatus for punching a pattern of holes in a web moving along a path of travel, said apparatus comprising:

an annular die ring rotatably mounted on one side of said path of travel and presenting a plurality of spaced-apart, radially oriented dies mounted to said ring;

an annular punch ring rotatably mounted on the other side of said path of travel and presenting

structure defining a plurality of spaced-apart, radially oriented bores extending from the outermost surface of said punch ring into said ring;

punching means operatively received in each bore and having a distal shearing end, said punching means being shiftable between an outermost, punching position and an innermost, retracted position;

means for biasing said punching means towards said retracted position;

control means movable to and from a location for selectively shifting certain of said punching means and retaining said certain of said punching means in said punching position while the control means is in said location thereof such that said certain of said punching means are positioned in said punching position and the remaining punching means are retained in said retracted position,

said control means being operable to fixedly retain said certain of said punching means in said punching position during the entire rotational path of travel of said punch ring; and

means for rotating said punch and die rings whereby said certain of said punching means in the punch position engage said moving web and extend into a complementally aligned die thereby shearing said web and creating a hole therethrough, the said certain of said punching means in the punch position providing the desired pattern of holes in the web.

4,594,927
PUNCH HAVING IMPROVED CUTTER ATTACHMENT MEANS

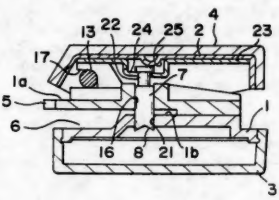
Chuzo Mori, Chiba, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Division of Ser. No. 532,487, Sep. 15, 1983. This application Jul. 23, 1985, Ser. No. 757,949

Claims priority, application Japan, Sep. 27, 1982, 57-145873; Jan. 31, 1983, 58-12987

Int. Cl.⁴ B26F *1/14*

U.S. Cl. 83—620 **3 Claims**



1. A punch comprising a base portion, a lever portion and a row of rod cutters,

said lever portion being pivotally attached to said base portion and having suspended therefrom said row of rod cutters;

said base portion incorporating therein a recess for receiving insertion of paper sheets and a support portion forming a bottom surface of said recess for supporting thereon the inserted ends of paper sheets;

said support portion of said base having a hole therein corresponding in position to a lower end of each of said plurality of rod cutters, said holes being adapted to permit penetration therethrough of said plurality of rod cutters upon lowering of said lever toward said base;

a distance, between said lower ends of said plurality of rod cutters and said support portion of said base, gradually increasing from one end to an opposite end of the lateral row of rod cutters;

an annular groove formed in an upper portion of each said rod cutter at a fixed distance from a top end of said rod cutter;

holes adapted to fit around said annular groove formed in a lower side of said lever to support said plurality of rod cutters relative to said lever; and

a depression formed on an upper side of said lever, such that the bottom of said depression abuts intimately upon the heads of said rod cutters.

4,594,928
KNIFE CYLINDER FOR WORKING WEBLIKE MATERIAL

Hermann Thomas, Darmstadt, and Josef Herd, Munster, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Goebel GmbH, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 575,295

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303628

Int. Cl.⁴ B26D *1/00*

U.S. Cl. 83—698 **5 Claims**

1. A knife cylinder for working weblike material, said cylinder being mounted on a frame for rotation about its axis of rotation, and comprising:

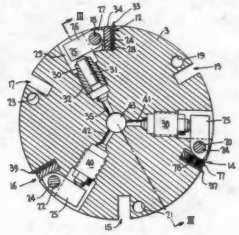
a cylindrical surface portion having at least one groove formed therein for receiving and positioning at least one knife substantially parallel to said axis of rotation;

a plurality of pressure medium cylinders distributed over the length of said knife for pressing said knife against said knife cylinder;

a pressure medium generating assembly attached to said knife cylinder for rotation together therewith, said assembly including a pressure generator for pressurizing said pressure cylinders;

a force transmission device disposed between each one of said pressure cylinders and said knife;

said assembly further including spring means operatively associated with said pressure generator for maintaining a



predetermined pressure within said pressure cylinders; and

conduit means within said knife cylinder and communicating with said pressure generator for transmitting pressure medium from said pressure generator to each one of said pressure cylinders.

4,594,929
MICROTOME HAVING SPECIMEN RETRACTION MEANS

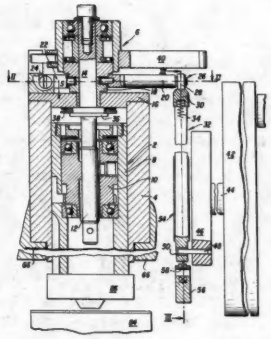
Werner Behme, Walldorf, and Manfred Berleth, Eppelheim, both of Fed. Rep. of Germany, assignors to Parke, Davis & Company, Morris Plains, N.J.

Filed Jan. 30, 1985, Ser. No. 696,361

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404098

Int. Cl.⁴ G01N *1/06*

U.S. Cl. 83—715 **10 Claims**



1. A microtome having a knife for sectioning a specimen comprising,

a stand,

a vertically-slideable guide means mounted on said stand,

drive means for inparting a reciprocating vertical motion to said guide means,

a specimen holder slideably mounted on said guide means, said holder being slideable along a horizonal path extending toward the knife,

adjustment means engaging said holder for moving the specimen holder along the horizonal path,

retraction means connecting said adjustment means to said

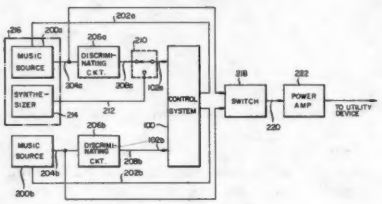
guide means and being operably connected to said drive means to move said specimen holder from an unretracted position to a retracted position, when actuated by said drive means.

4,594,930

APPARATUS FOR SYNCHRONIZING PLAYBACK RATES OF MUSIC SOURCES

Naoyuki Murakami, 2-12-2-704, Kyuden, Setagaya-ku, Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,214
Claims priority, application Japan, May 10, 1983, 58-81287
Int. Cl.[4] G10H *1/40, 3/09;* **G11B** *31/02*
U.S. Cl. 84—1.02 **24 Claims**



1. Apparatus for synchronizing the playback rates of a plurality of music sources comprising:

reference generating means for generating a reference signal including beats representative of a desired tempo;

first music reproducing means controllable in the playback rate for producing a music signal representative of music, wherein said music signal is recorded on either of a phonographic disk or tape in the form of analog waveforms;

first discriminating means operative in response to said music signal for extracting the beats involved in the music signal to produce a beat signal representative of the extracted beats; and

control means interconnected to said reference generating means, said first music reproducing means, and said first discriminating means for determining a time difference between the occurrence of beats involved in said reference signal and the occurrence of the beat signal in order to regulate the playback rate of said first music reproducing means so as to make the time difference therebetween substantially constant;

said first music reproducing means produces said music signal with a phase difference between the beats involved in the music signal which is substantially constant with respect to the beats involved in said reference signal.

4,594,931

ELECTRONIC MUSICAL INSTRUMENT FOR READING OUT AND PERFORMING MUSICAL TONE DATA PREVIOUSLY STORED

Hiroshi Ishii, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 415,439, Sep. 7, 1982, Pat. No. 4,522,100, which is a continuation of Ser. No. 189,760, Sep. 23, 1980, abandoned. This application Dec. 20, 1984, Ser. No. 683,930
Claims priority, application Japan, Sep. 29, 1979, 54-126185; Sep. 29, 1979, 54-126186; Sep. 29, 1979, 54-126187; Sep. 29, 1979, 54-126188
Int. Cl.[4] G10H *1/36*
U.S. Cl. 84—1.03 **18 Claims**

1. An electronic musical instrument comprising:

a keyboard having a plurality of performance keys, each performance key being associated with a musical note;

memory means for serially storing pitch codes sequentially corresponding to a series of musical notes constituting a musical piece;

changeover switching means coupled to said keyboard for selectively switching an operation mode of said keyboard to a first normal performance mode, a second mode, or a third mode; in said first mode the performance keys on said keyboard designating the musical notes, in said second mode the performance keys on said keyboard permitting the pitch codes to be read out of said memory means sequentially, and in said third mode the performance keys on said keyboard inputting the pitch codes of said series of musical tones into said memory means;

musical tone generating means coupled to said keyboard, to said memory means and to said changeover switching means for generating musical tones in accordance with a key operation on said keyboard when said operation mode of said keyboard is switched to said first mode, and for generating musical tones corresponding to the pitch codes read out from said memory means when said operation mode of said keyboard is switched to the second mode, and for generating musical tones corresponding to the pitch codes to be inputted into said memory means by the key operation of said keyboard when said operating mode of said keyboard is switched to said third mode; and

address incrementing means coupled to said memory means and to said changeover switching means, and being responsive to operation of any one of the performance keys on said keyboard when said operation mode of said keyboard is switched to the second mode for incrementing an address of the memory means by an operation of said any one of the keys on said keyboard such that pitch codes stored in said memory means are read out sequentially from said memory means according to an increment of the address of said memory means and said musical tones being formed by said musical tones generating means;

said address incrementing means incrementing an address of the memory means by the inputting operation of the performance keys on said keyboard when said operation mode of said keyboard is switched to third mode such that pitch codes corresponding to the key operation are stored in the address of said memory means which is designated by said address incrementing means.

4,594,932

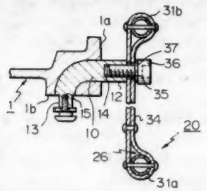
PIANO PLATE MOUNTING STRUCTURE FOR UPRIGHT PIANO

Fusao Nozue, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jul. 24, 1984, Ser. No. 633,865
Claims priority, application Japan, Jul. 27, 1983, 58-137068
Int. Cl.[4] G10C *3/04*
U.S. Cl. 84—185 **6 Claims**

1. An improved piano plate mounting structure for an upright piano including a frame and at least one action bracket, said piano plate mounting structure comprising a piano plate of

cast material mounted to said frame for holding strings under tension, and connectors embedded in said piano plate in the



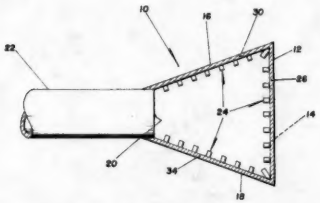
form of inserts during casting of said piano plate and adapted for coupling at least one action bracket of said upright piano to said piano plate.

4,594,933

MUZZLE BRAKE FOR DISPERSAL OF AN AEROSOL FROM A CANNON

Frank H. Bell, Logan, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Jan. 11, 1984, Ser. No. 569,808
Int. Cl.[4] F41F *17/12*
U.S. Cl. 89—14.3 **4 Claims**



1. A muzzle brake for dispersal of an aerosol from a cannon comprising,

a baffle, said baffle having a centrally located port therein, upper and lower imperforate plate elements for the attachment of said baffle, in spaced relation, to the muzzle of the cannon barrel with said port in alignment with the muzzle of the cannon, and

a plurality of blades formed on the surfaces of said baffle and of said plate elements that face the muzzle of the cannon barrel, said blades extending into the blast stream of gases including the aerosol that are ejected from the muzzle when the cannon is discharged thereby to create a plurality of vortices for the optimum dispersal of the aerosol.

4,594,934

BURST FIRE CONTROL MECHANISM

John H. Holstein, 5304 N. Colonial #102, Fresno, Calif. 93704; Robert C. McCarty, 9425 Marcella Ave., Gilroy, Calif. 95020, and Walter G. Parrish, 1286 E. Plymouth Way, Fresno, Calif. 93710

Filed Dec. 5, 1983, Ser. No. 558,284
Int. Cl.[4] F41D *11/10*
U.S. Cl. 89—129.02 **20 Claims**

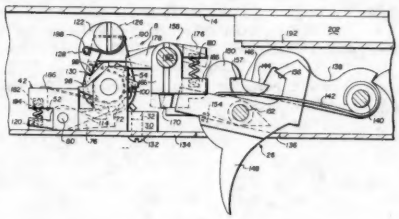
1. A burst fire control mechanism for an automatic firearm including a bolt longitudinally reciprocally displaceable in a receiver, comprising:

(a) a hammer mechanism having rearward and battery positions pivotally mounted in said receiver for firing a round after being pivoted from said rearward to said battery position;

(b) a trigger assembly pivotally mounted in said receiver rearward of said hammer mechanism and including a portion engagable with said hammer mechanism for permitting said hammer mechanism to pivot between said rearward and said battery position;

(c) selector blade means for pre-selecting a number of rounds to be fired and having safety, semi-automatic, and burst fire firing configurations pivotally mounted in said receiver rearward of said trigger assembly and including means engagable with said trigger assembly for selecting one of said safety, semi-automatic, and burst fire firing configurations;

(d) a burst fire control mechanism mounted in said receiver rearward of said selector blade means;



(e) said burst fire control mechanism including means engagable with said bolt for counting said pre-selected number of fired rounds; and,

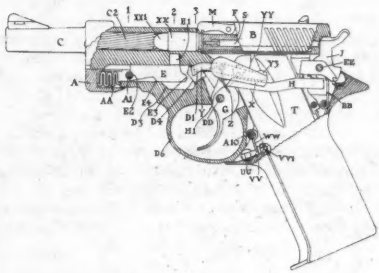
(f) said burst fire control mechanism when in burst fire firing configuration and when said firearm is fired including means engagable with said selector blade means after said pre-selected number of rounds have been fired and counted for causing said selector blade means to pivot from said burst fire to said semi-automatic firing configuration whereby said selector blade means engages said trigger means thereby selecting said semi-automatic firing configuration to thus interrupt burst firing.

4,594,935

BREECH LOCKING SYSTEM FOR SELF LOADING FIRE ARMS

David E. Smith, 5 Park Avenue, Telscombe Cliffs, Sussex, England

Filed Mar. 26, 1984, Ser. No. 593,396
Claims priority, application United Kingdom, Mar. 28, 1983, 8308421
Int. Cl.[4] F41D *3/00, 5/02*
U.S. Cl. 89—176 **13 Claims**



1. A self loading fire arm of the locked breech, short recoil pistol type having a barrel and a breech block slide provided with a separate locking block accommodated between the underside of said barrel and the upper surface of a movable trigger guard, said locking block having means for positively locking the barrel to the slide during the high pressure period of the firing cycle of the fire arm and means for releasing the slide from the barrel during the remainder of the firing cycle, said trigger guard being normally locked to the frame, and

hold open means operable in the absence of cartridges in a magazine and in the breech to allow said slide to be held in the fully retracted position and simultaneously to release said trigger guard for limited forward and downward movement, said trigger guard being provided with means which on said movement cause said locking block to disengage from the barrel, whereby the barrel can be removed without the necessity for further disassembling of the fire arm.

4,594,936

HYDRAULIC DISTRIBUTOR FOR A SERVOMECHANISM WITH REACTION ON THE INPUT COMPONENT

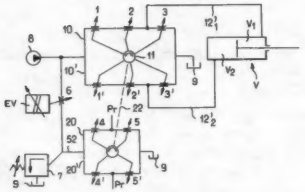
Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Nov. 5, 1984, Ser. No. 668,436

Claims priority, application Spain, Nov. 18, 1983, 527578

Int. Cl.[4] F15B *13/04, 9/10, 11/10*

U.S. Cl. 91—51 **14 Claims**



1. A hydraulic distributor for a fluid operated servo-mechanism, more particularly for the servo-steering of a motor vehicle, comprising a primary component coupled to an input actuating component, and a secondary component, said primary and secondary components mutually couplable through a lost-motion coupling allowing a limited relative displacement between said primary and secondary components on each side of a central rest position, said primary and secondary components mutually defining at least one first pair of parallel fluid circuits between a source of pressure and a reservoir, each said circuit including at least first, second and third restriction means arranged in series in a direction of flow between said source of pressure and said reservoir and operable as a result of said relative displacement between said primary and secondary components so as to control a hydraulic assistance device having two opposing chambers each in fluid connection with a respective circuit of said first pair of parallel fluid circuits downstream of said first restriction means, wherein each said chamber of said assistance device is in fluid communication with said respective circuit between said second and third restriction means of said respective circuit, said first restriction means when brought into throttling operation adapted to introduce in said respective circuit a restriction of fluid flow which is substantially constant during said relative displacement, said third restriction means when brought into throttling operation adapted to introduce in said respective circuit a progressive restriction of fluid flow and which progressive restriction varies substantially linearly with said relative displacement.

4,594,937

SERVOMOTOR FOR BRAKING ASSISTANCE

Guy Meynier, Aulnay sous Bois, and Alain Thioux, Chenevieres, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Feb. 15, 1985, Ser. No. 701,900

Claims priority, application France, Feb. 22, 1984, 84 02655

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369 R **12 Claims**

1. A braking assistance servomotor comprising:

a casing,

a piston structure dividing said casing internally into two chambers,

distribution valve means situated in a tubular valve body firmly fixed centrally to said piston structure and actuated by an input member to create selectively a pressure differential between said chambers,

said distribution valve means comprising:

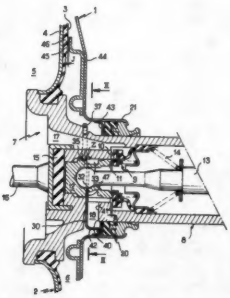
a plunger mounted so as to slide axially in said valve body, coupled to said input member and defining at one end a movable valve seat;

a valve body seat formed internally by said valve body, concentric with said movable valve seat;

a valve member mounted in said valve body and resiliently biased toward said valve body seat and movable valve seat;

a return spring supported in said valve body and biasing said input member in a direction away from said valve body and movable valve seat, and

further comprising a retaining member having a first portion extending into a radial recess in said valve body for cooperation in abutment with a peripheral shoulder of said plunger and a second portion outside said valve body for cooperation with a stationary component in fixed relationship relative to said casing, said retaining member having



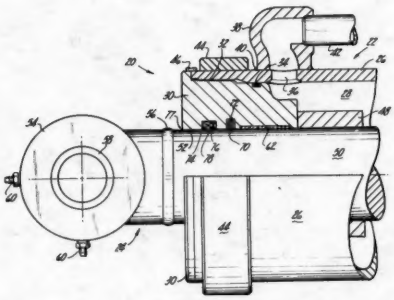
the second portion pivotingly supported on said valve body by shaft means mounted in said valve body and extending perpendicular to a direction of sliding of said plunger, said radial recess having an axial extension such that, when said retaining member is pivoted about said shaft means in a direction toward said valve member under the effect of said return spring, a zone of said first portion of said retaining member comes into abutment with a corresponding radial end surface of said radial recess adjacent said valve member and remote radially from said shaft means, so as to determine for said plunger a position of maximum retraction relative to said valve body seat, said retaining member comprising a plate shaped so that said first portion has a U-shaped configuration with a free end cooperating in abutment with said peripheral shoulder of said plunger and said second portion also has a U-shaped configuration with arms extending about each side of said valve body and beyond said free end of said first portion, said arms having free arm ends journaled on said shaft means mounted in said valve body, and said second portion of said retaining member formed centrally with a finger bent substantially perpendicular to the general plane of the plate and in said direction toward the valve member for abutment with said stationary component.

4,594,938

PRESSURE RELIEVED PISTON ROD SEAL

Daniel B. Shore, Moline, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 26, 1984, Ser. No. 634,717
Int. Cl.[4] F15B *21/04*
U.S. Cl. 92—82 12 Claims



1. A pressure relieved piston rod seal for a piston-cylinder, said piston-cylinder including a cylinder having a pressure chamber therein and a piston reciprocal in said cylinder chamber having a rod portion extending out of said cylinder through a passage, said passage having an internal wall generally conforming to the exterior surface of said piston rod portion including two spaced annular channels opening toward said piston rod portion,

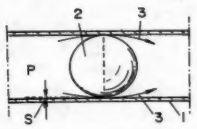
said piston rod seal comprising a first sealing means, in a first passage channel, located relatively adjacent the external opening of said passage, bearing in sealed relation against said piston rod portion, and a second sealing means, in a second cylinder passage channel, located relatively adjacent said cylinder chamber, said second sealing means comprising a resilient annular sealing polymeric ring having an internal face bearing in sealed relation against said piston rod portion, said second annular passage channel having side walls and said sealing ring having a width which is less than the width of said second channel measured between said side walls, said sealing ring having a first side face, adjacent said first sealing means, generally conforming to the adjacent side wall of said second channel, and said sealing ring having a fluid passage means providing communication between said first side face and the opposed side face at said internal face, whereby said second sealing means functions as a unidirectional seal, wherein said sealing ring first side face seals against said channel adjacent side wall when the fluid pressure in said cylinder pressure chamber is greater than the fluid pressure between said sealing means, and said second sealing means permitting fluid flow through said passage means into said cylinder chamber, through said passage means, when the fluid pressure between said sealing means is greater than the pressure in said cylinder chamber.

4,594,939

METHOD FOR CONTROLLING THE GAP PRESENT BETWEEN THE WALL OF A CYLINDER BARREL AND A BALL PISTON AND APPARATUS EMBODYING THE METHOD

Cornelis J. van Os, Emmen, Netherlands, assignor to Noord-Nederlandsche Machinefabriek b.v., Winschoten, Netherlands

Continuation of Ser. No. 349,966, Feb. 18, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 657,044
Claims priority, application Netherlands, Feb. 20, 1981, 8100867
Int. Cl.[4] F01B *11/02*
U.S. Cl. 92—169 14 Claims



1. Hydraulic apparatus comprising:

a cylinder having a longitudinal axis and substantially concentric inside and outside walls, said cylinder being capable of having its inside diameter elastically changed by differential forces on said outside and inside walls,

a pressure fluid contained in said cylinder,

a piston closely adjacent said inside wall of said cylinder, said piston having a sealing length portion the cross-section of which in a plane containing said axis is defined in part by a pair of opposed convex arcs and a high pressure side along said axis on one side of its sealing length portion and a low pressure side along said axis on the other side of its sealing length portion, said sealing length portion being slightly smaller than the inside diameter of the cylinder surrounding the high pressure side of the piston, thereby forming a gap with said inside wall for allowing fluid flow from said high pressure side to said low pressure side of said piston, and

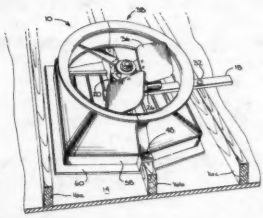
means for causing the inside diameter of said cylinder to arch around said sealing length portion of said piston on said low pressure side thereof by exerting a pressure on the outside wall of said cylinder.

4,594,940

FAN FOR VENTILATION

David W. Wolbrink, Hartford, and Dieter W. Otte, Rubicon, both of Wis., assignors to Broan Mfg. Co., Inc., Hartford, Wis.

Continuation of Ser. No. 586,050, Mar. 5, 1984, abandoned. This application Aug. 9, 1985, Ser. No. 764,953
Int. Cl.[4] F24F *7/06*
U.S. Cl. 98—42.1 9 Claims



1. A ventilation fan structure positionable across an opening in a bulding member having a pair of structural elements, one

of which extends across the opening, the other of which does not, said fan structure comprising:

a mounting member spanning the structure mountable thereon in the opening of the building member, said mounting member having one end fastenable to the structural element extending across the opening and the other end fastenable to the other structural element;

rotary drive means fastened to said mounting member so as to be positioned above said mounting member and generally in alignment with the structural element extending across the building member opening;

rotatable fan blade means coupled to said rotary drive means for moving air through the opening, said fan blade means being positioned above said mounting member and generally in alignment with the structural element extending across the building member opening; and

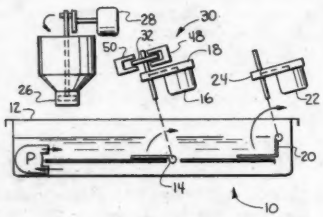
a shroud affixable to the building member independently of said mounting member means and at least partially surrounding said mounting member, said shroud having a first portion mateable with the periphery of the building member opening and formed to accommodate the structural element extending across the opening and a second portion formed to embrace said fan blade means and having a venturi-like configuration, said mounting member extending through said shroud for mounting to the other structural element of the pair.

4,594,941

FOOD COOKING MACHINE WITH CONTROL MECHANISM

Edward M. Anderson, 2620 E. Medicine Lake Blvd., Minneapolis, Minn. 55441

Filed May 21, 1984, Ser. No. 612,579
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—334 **21 Claims**



1. A multiple mode food frying machine having;

a. a deep fat cooker;

b. means associated with said cooker for manipulating food in the cooker;

c. a multiple mode control for said manipulating means, said control having;

(1) a cam with first and second control contours,

(2) a first sensor mounted to sense the first control contour and to control the manipulating means therefrom in a first mode.

(3) a second sensor mounted to sense the second control contour and to control the manipulating means therefrom in a second mode, and

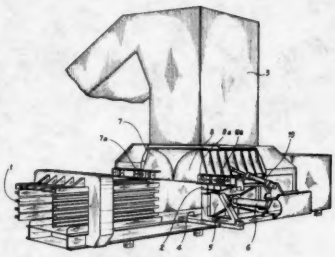
(4) a selector connected firstly in between said manipulating means and the first sensor, and in between the manipulating means and the second sensor for selection of one of operating modes offered by the control.

4,594,942

BALING PRESS WITH LARGE SUPPLY HOPPER

Else M. Denneboom, Boekelo, Netherlands, assignor to B.V. Machinefabriek BOA, Netherlands

Filed Feb. 12, 1985, Ser. No. 701,035
Int. Cl.[4] B30B *7/04*
U.S. Cl. 100—137 **3 Claims**



1. A baling press comprising:

a substantially horizontal main pressing box having a substantially rectangular cross section;

a pressing plunger mounted for movement within the main pressing box in a direction parallel to the longitudinal axis thereof;

a side pressing box positioned along one side edge of the main pressing box and having a side pressing plunger mounted for movement within the side pressing box and in a direction generally perpendicular to the longitudinal axis of the main pressing box so that material within the side pressing box may be compressed into the main pressing box by movement of the side pressing plunger;

a supply hopper for material to be baled positioned above the main and side pressing boxes, the hopper being of rectangular shape and in communication with the interiors of both pressing boxes by a passage of the same size and shape as the horizontal cross section of the supply hopper;

a pre-pressing unit in said passage, said pre-pressing unit comprising two members each in the form of a quarter section of a cylinder, each quarter section having a rectangularly shaped plane face and an adjacent curved face, said members being mounted for rotation about their longitudinal axes with said axes being positioned generally parallel to the longitudinal axis of the main pressing box and each axis being generally in the same plane as one sidewall of the supply hopper, one of the members being above said side pressing box;

means for causing simultaneous rotation of said members about their axes so that upon a quarter turn of rotation the plane face of each member will move from a position substantially parallel with the hopper sidewalls to a position substantially perpendicular to said hopper sidewalls, the two plane faces thus forming a top wall on the main pressing box;

means for biasing the axis of the member which is above the side pressing box in a direction toward the other member.

4,594,943

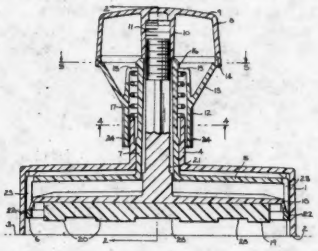
INK STAMP

Daniel R. Nettesheim, Waukesha; Daniel D. Nettesheim, New Berlin, and John H. Carpentier, Milton, all of Wis., assignors to Schwaab Inc., Milwaukee, Wis.

Filed Jan. 24, 1985, Ser. No. 694,593
Int. Cl.[4] B41K *1/00*
U.S. Cl. 101—327 **10 Claims**

1. A manually operated ink stamp, comprising a base having an open bottom bordered by a bottom edge and having a top wall with an opening therein, a frame disposed within the base, said frame having an open bottom bordered by a lower edge, a

handle connected to the frame, means for preventing relative axial movement between the frame and said handle, biasing means for urging the frame and the handle to a raised position relative to the base, a die holder disposed within the frame, a printing die mounted on the die holder, said die having a lower surface bearing indicia and projecting downwardly beyond the lower edge of the frame when the frame is in the raised position, and adjusting means interconnecting the handle and the die holder for adjusting the vertical position of the die holder and die relative to the frame, a downward force applied to the handle causing downward movement of the frame and die holder relative to the base to bring said die into contact with a material to be printed and engagement of the lower edge of said frame with said material providing a stop to limit downward movement of said die.

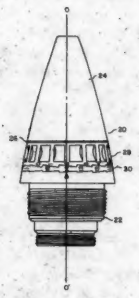


4,594,944

SETTING RING SYSTEM FOR ELECTRONIC TIME FUZING

Leo P. Rongus, Takoma Park; David L. Overman, and Robert N. Johnson, both of Silver Spring, all of Md., assignors to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 27, 1984, Ser. No. 635,011
Int. Cl.[4] F42C *17/00*
U.S. Cl. 102—221 **7 Claims**



1. A system for manually setting a numerical value to be encoded to an electronic device having a housing which includes an axis and an external surface extending symmetrically about the axis, and displaying said numerical value adjacent an indication mark on the external surface of the housing, comprising:

a first setting ring which is disposed about the housing and is interconnected with the housing to be manually rotatable about the housing axis in at least one direction of rotation against a restraining force to a plurality of predetermined positions or settings, said first ring having an outer surface which includes a plurality of first numbers in standard decimal format corresponding to said plurality of first ring settings, said plurality of first numbers being disposed so that one of said first numbers is axially aligned with said indication mark at each first ring setting, said plurality of first numbers ranging from a minimum number to a maximum number in equal first increments of 1;

a second setting ring which is disposed about the housing adjacent and parallel to said first ring and which is interconnected with the housing to be manually rotatable about the housing axis in at least one direction of rotation against a restraining force to a plurality of predetermined positions or settings, said second ring having an outer surface which includes a plurality of second numbers corresponding to said plurality of second ring settings, said plurality of second numbers being disposed so that one of said second numbers is axially aligned with said indication mark at each second ring setting, said plurality of first numbers and said plurality of second numbers being oriented in a common lateral direction with the first numbers being disposed to the right of the second numbers so that the combination of first and second numbers aligned with the indication mark at each combination of first and second ring settings constitutes said numerical value to be encoded to the electronic device, the first number constituting a first or more significant portion of the numerical value and the second number constituting a second or less significant portion of the numerical value, said plurality of second numbers ranging from zero to a maximum number in equal second increments such that the indicated numerical value can be manually adjusted in equal increments from a minimum value to a maximum value, with the total number of selectable numerical values being equal to the number of first ring settings times the number of second ring settings; and

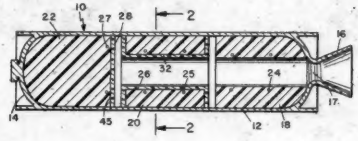
encoding means, actuated by said first and second rings, for encoding the indicated numerical value to the electronic device.

4,594,945

THERMAL PROTECTION FOR PROPELLANT GRAINS

George Alexandris, Redlands, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Nov. 28, 1984, Ser. No. 676,028
Int. Cl.[4] C06B *45/12*
U.S. Cl. 102—287 **8 Claims**



1. Thermal protection for use with a protected grain of a multiple grain solid propellant rocket motor having a single combustion chamber and thrust nozzle, comprising:

a flexible frangible barrier layer of pressed granular material held together by a binder material and bondable over the combustion surface of the protected grain said layer comprising means for preventing ingition of said combustion surface by the burning of an adjacent propellant grain and means for fracturing into small pieces to be propelled out through the thrust nozzle on ignition of the protected grain, and

means for bonding said barrier layer over the entire area of said protected grain surface.

4,594,946

SHAPED CHARGE CHAIN WITH BOOSTER

Konrad Ringel, Leinburg, and Rainer Vockentanz, Rednitzhembach, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,426

Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416468

Int. Cl.[4] F42B 1/02

U.S. Cl. 102—307 1 Claim

1. In a chain of shaped charges consisting of a plurality of charges in which each charge has plane side surfaces, including a booster charge positioned above a main explosive charge, said booster charge extending from one side surface to the oppositely located side surface; the improvement comprising: said booster charge being constituted of an explosive material having a detonation velocity higher than that of the explosive material of the main explosive charge, the detonation velocity of the booster charge being at least by about 8% higher than the detonation velocity of the main explosive charge, and wherein the booster charge extends as a unitary component across said plurality of main explosive charges.

4,594,947

APPARATUS FOR SHAPING A DETONATION WAVE

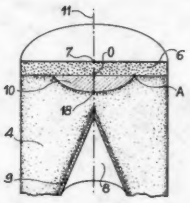
Julien Aubry, Pavillons/Bois, and André Cachin, Nevilly, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 19, 1984, Ser. No. 632,546

Claims priority, application France, Jul. 28, 1983, 83 12481

Int. Cl.[4] F42B 1/02

U.S. Cl. 102—307 11 Claims



1. An apparatus for shaping a detonation wave comprising:
a priming explosive mass;
a charging explosive mass in contact with said priming explosive mass along a contact surface;
a shield separating said priming explosive mass and said charging explosive mass over a portion of said contact surface;
initiating means to create a detonation wave which propagates through the priming explosive mass and passes around said shield before propagating through said charging explosive mass, thus creating a shock wave which propagates through the shield before entering the charging exlosive mass;
said shield being made of a porous material and having such shape and dimensions so as to dampen the shock wave to the extent that, in the charging explosive mass, the detonation wave is always in front of the shock wave as it issues from the shield.

4,594,948

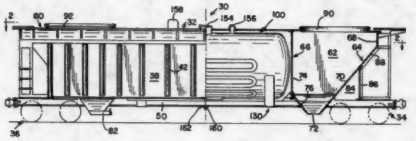
LIQUID AND SOLID DUAL LADING RAILROAD CAR

Kenneth H. Smith, Smyrna, and Walter J. Marulic, Dunwoody, both of Ga., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Sep. 4, 1984, Ser. No. 646,976

Int. Cl.[4] B61D 5/06, 7/00

U.S. Cl. 105—359 3 Claims



1. A railroad comprising:
a car body supported at each end by a truck;
the car body having a stub center still at each end;
the car body including a pair of spaced apart upwardly extending longitudinal side wall;
a side still along the bottom portion of each car body side wall;
a shear plate interconnecting each stub sill and adjacent side still portions;
a roof supported by the side walls;
a hopper at each end of the car for carrying solid flowable lading;
each hopper being defined by a portion of each side wall and roof, and a pair of spaced apart hopper end walls extending laterally between the side walls;
a hopper inlet across hatch opening in the roof for each hopper and a hopper discharge opening at the bottom of each hopper with door means to close the opening;
an elongated tank horizontally located between the hoppers and roof;
means mounting and supporting the tank between the car body side walls and roof with a bottom area of the tank fixedly secured with respect to the car body whereby the positional arrangement of the tank bottom area to the car body is maintained upon expansion of contraction of the tank with temperature change;
a shear plate to which the said tank bottom area is fixedly secured, joined to the side sills; and
means to fill the tank with liquid through the roof and means for removing liquid from the tank.

4,594,949

HOLDDOWN BAR FOR A HATCH COVER OF A RAILROAD CAR

Donald L. Kleykamp, Washington Township, Montgomery County, Ohio, assignor to Dayco Corporation, Dayton, Ohio

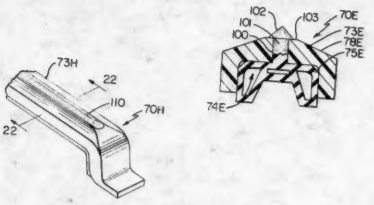
Filed Jan. 31, 1983, Ser. No. 462,730

Int. Cl.[4] B61D 39/00

U.S. Cl. 105—377 14 Claims

1. In a railroad car having a hatch cover provided with opposed ends and a holddown bar for said hatch cover, said holddown bar having opposed ends one of which is pivotally mounted to said car and the other of which is releasably latched to said car while a medial portion thereof intermediate said opposed ends extends transvesely across said hatch cover, said medial portion of said holddown bar carrying a sealing gasket means that is adapted to engage against said hatch cover when said holddown bar is disposed in its closed position, said medial portion of said holddown bar having a surface means

adapted to engage a certain structure of said car outboard of the hatch thereof when said holddown bar is pivoted to a hatch opening position thereof, the improvement wherein said surface means comprises part of said gasket means and thereby



defines a resilient bumper means carried by said holddown bar for engaging said structure of said car when said holddown bar is pivoted thereagainst whereby said bumper means tends to prevent damage to said structure when said holddown bar is pivoted to said open position thereof.

4,594,950

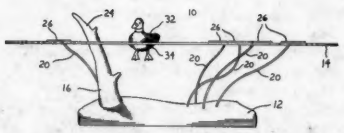
TABLE CONSTRUCTION

Keith Morris, Rte. 3, Grand Marais, Minn. 55604

Filed Jun. 29, 1984, Ser. No. 626,409

Int. Cl.[4] A47B *35/00*

U.S. Cl. 108—50 **17 Claims**



1. A decorative table in which objects on the table appear as natural objects emerging from the surface of a natural body of water, comprising a base; one or more support members generally rising from said base to a predetermined height; a flat transparent table top supported on said support members and providing the appearance of being the surface of said body of water; and one or more continuation members of said one or more support members attached to an upper surface of said table top and aligned with their respective support members to provide the illusion that said support members pierce the surface of said body of water, wherein said support members include rods rising from said base and support blocks on said rods on which the table top rests, and their respective continuation members include flat members fashioned to resemble leaves of aquatic plants, the rods resembling submerged stems thereof.

4,594,951

REGULARIZING DEVICE FOR THE DEPTH OF A FURROW

Xavier R. Grataloup, Montereau, France, assignor to J. I. Case Company, Racine, Wis.

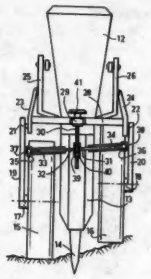
Filed Jan. 15, 1979, Ser. No. 3,642

Claims priority, application France, Jan. 25, 1978, 78 02081

Int. Cl.[4] A01C *5/06, 7/20*

U.S. Cl. 111—85 **18 Claims**

1. In a seed planter having a planter unit frame means adapted to be attached to a tool bar, furrow-opening means mounted fixed and immovable relative to said frame means during movement of said frame means in the performance of a seed planting operation, a pair of gauge wheels one each on opposite sides of said furrow opening means rotatably mounted on the lower ends of support arms which are pivotably mounted on said frame means, seed dispensing means mounted on said frame means, the improvement which comprises equalizer arm means operatively interconnecting said gauge wheel support arms for causing approximately equal and opposite



rotation of said support arms to reduce the vertical displacement of said planter unit frame means and said furrow opening means relative to the displacement of said gauge wheels as the gauge wheels individually encounter irregularities and obstacles in their path of travel.

4,594,952

EMBROIDERING MACHINE

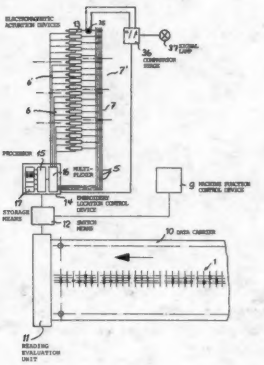
Georg Comploi, Bludenz; Arthur Loacker, Götzis, both of Austria; Kurt Huber, Arbon, Switzerland; Wilhelm Hutter, Roggwil, Switzerland, and Hans Wallimann, Goldach, Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Oct. 3, 1984, Ser. No. 657,172

Claims priority, application Switzerland, Oct. 6, 1983, 5447/83

Int. Cl.[4] D05C *11/06*

U.S. Cl. 112—84 **16 Claims**



1. An embroidering machine having a plurality of embroidering locations arranged in at least one row, comprising:

translatably guided embroidering implements for said embroidering locations;

embroidering implement drive means cooperating with said embroidering implements;

electromagnetic actuation devices for said embroidering implements;

said embroidering implements being capable of being selectively coupled to and uncoupled from said embroidering implement drive means according to a predetermined repeti-

tion and color-change program containing predetermined data by means of said electromagnetic actuation devices;

at least predetermined individual ones of said embroidering locations of all of said plurality of embroidering locations being contained in predeterminate switching units;

each switching unit of said predeterminate switching units including at least two of said electromagnetic actuation devices for each embroidering location in each said switching unit;

each of said electromagnetic actuation devices having an input side and an output side;

each said switching unit having a common input conductor for said at least two electromagnetic actuation devices thereof;

an embroidering location control device connected to said electromagnetic actuation devices of said embroidering implements;

said at least two electromagnetic actuation devices of each said switching unit being connected in parallel to said common input conductor at said input side thereof and via said common input conductor to said embroidering location control device;

each said switching unit having a number of individual output conductors associated therewith and corresponding to the number of electromagnetic actuation devices in each said switching unit; and

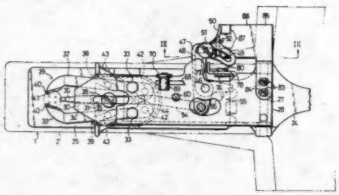
each said electromagnetic actuation device of all of said predeterminate switching units being connected in series with said embroidering location control device at said output sides thereof via said individual output conductors.

4,594,953

BUTTON SEWING MACHINE

Hideo Ando; Hideo Kawaguchi, and Yasuhiko Watanabe, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 27, 1985, Ser. No. 770,035
Claims priority, application Japan, Sep. 5, 1984, 59-185746
Int. Cl.⁴ D05B *3/14*
U.S. Cl. 112—112 **11 Claims**



1. A button sewing machine comprising:

a frame including a bed;

a main shaft rotatably supported by said frame and drivable by a drive source;

a sewing needle responsive to rotation of said main shaft for reciprocating movement along a path to sew a button to a fabric;

button gripping means having gripping portions for gripping and releasing the button on said path and movable on said bed across said path in response to rotation of said main shaft;

detector means for ascertaining whether the button is gripped by said gripping portions; and

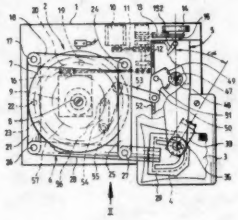
control means for driving said main shaft to enable said sewing needle to sew the button to the fabric in response to a signal generated by said detector means when the button is gripped by said gripping portions.

4,594,954

SEWING DEVICE WITH A SEWING HEAD INCLUDING A ROTARY HOUSING

Horst Bernewasser, Steinhagen, Fed. Rep. of Germany, assignor to Kochs Adler, AG, Bielefeld, Fed. Rep. of Germany

Filed Feb. 15, 1985, Ser. No. 702,039
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411178
Int. Cl.⁴ D05C *21/00, 9/04*
U.S. Cl. 112—121.15 **7 Claims**



1. A sewing device having:

a sewing head;

a feeding means for producing a two-axis relative movement between said sewing head and a workpiece to be sewn;

a main drive shaft;

a supply of a thread;

said sewing head including:

a housing rotatably pivoted at said sewing head by means of a hollow shaft having an axis of rotation,

said housing including:

a crank means driven by said main drive shaft;

a needle bar pivotally received and reciprocatingly driven by said crank means;

a needle fastened to said needle bar, said needle receiving said thread and longitudinally extending about said axis;

thread control means;

an up and downwardly movable presser foot; and

drive means operating said presser foot, said thread being fed from said supply through said hollow shaft to said thread control means,

and said drive means being supplyable with energy by at least one supply line from the outside, and

a rotary coupling means concentrically provided to said hollow shaft and having:

at least one supply line for said energy; and

a coaxial bore for said thread.

4,594,955

HEMMING MACHINE WITH FUSING TYPE SLITTER

Richard Lichtenberg, 10 Polly Dr., Huntington, N.Y. 11743

Filed Sep. 5, 1985, Ser. No. 772,921
Int. Cl.⁴ D05B *9/00, 35/02, 37/02*
U.S. Cl. 112—147 **7 Claims**

1. A hemming machine to hem material having sufficient thermoplastic content to fuse when exposed to heat generated by an ultrasonic device, said machine comprising:

first and second laterally spaced apart lower conveyer belts;

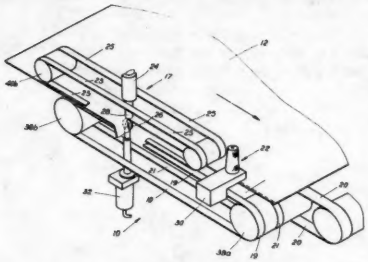
first and second laterally spaced apart upper conveyer belts;

a slitting device for simultaneously cutting and fusing the edge of material fed therethrough, said slitting device extending between said first and second lower conveyer belts and between said first and second upper conveyer belts;

said first upper belt and said first lower belt holding the material being fed between them prior to cutting and fusing by said slitting device;

said second upper belt and said second lower belt holding the material being fed between them prior to and subsequent to cutting and fusing by said slitting device;

a hemming device for automatically folding and sewing the edge of material fed therethrough to form a hem; and



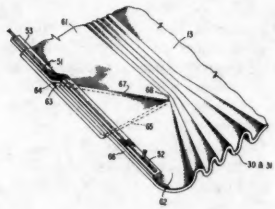
synchronizing means to feed and synchronize the flow of material from said slitting device to said hemming device, said hemming device being downstream from said slitting device.

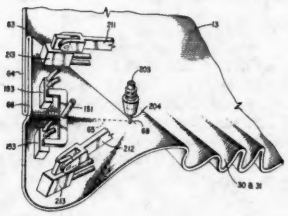
4,594,956

METHOD AND APPARATUS FOR SEWING MITERED CORNERS OF BOX TYPE ARTICLES

Artin G. Vartoukian, Roselle Park, and Robert P. Haggerty, Elizabeth, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Feb. 19, 1985, Ser. No. 702,975
Int. Cl.[4] D05B *1/00, 97/00*
U.S. Cl. 112—262.1 13 Claims





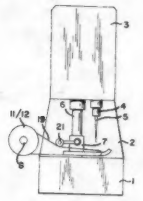
1. The method of forming and securing a mitered corner of a bed sheet or the like comprising the steps of arranging a substantially right-angle corner of a fabric panel in flat horizontal disposition with one of said right-angle corner edges parallel to a line of stitch formation, engaging said fabric panel along the other of said right-angle corner edges from said corner and for a predetermined distance along said other edge, transporting said engaged fabric panel edge into substantial alignment with said one of the right-angle corner edges, superposing said corner and a portion of said predetermined distance along said other edge over said one edge, and securing said superposed aligned edges together by a straight line of stitches.

4,594,957

SEWING MACHINE BELT FEED WITH VARIABLE PITCH DRIVE PULLEY

Wolf R. Von Hagen, Hemmingen, Fed. Rep. of Germany, assignor to Union Special GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,727
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344761
Int. Cl.[4] D05B *27/04*
U.S. Cl. 112—304 2 Claims



1. For use in combination with a sewing machine having needle means and a presser foot defining a sewing area, a work advancing mechanism comprising:

a continuous circulatory work engaging member, a portion of which passes beneath said presser foot; and

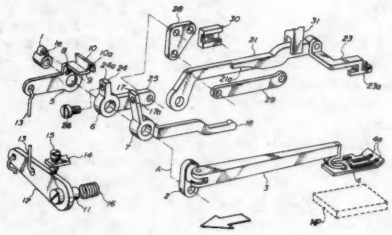
means for driving said circulatory member in synchronization with said sewing machine, said driving means including means to change the work advancing rate of said circulatory member comprising a pair of complimentary disk means each having tapering inner surface means which are each provided with radial channel means, said complimentary disk means being mutually adjustable toward and away from each other and said tapering inner surface means overlapping one another whereby defining a wedge shaped recess means; a plurality of radially adjustable bearing means accomodated with said channel means and being partially enveloped by said work engaging member at a location disposed remote from the sewing area; and a means for tensioning the work engaging member.

4,594,958

PRESSER FOOT LIFT DEVICE FOR A TOP FEED SEWING MACHINE

Hiroshi Ide, Tokyo, Japan, assignor to Tokyo Juki Industrial Co. Ltd, Chofu, Japan

Filed Jan. 31, 1985, Ser. No. 696,729
Int. Cl.[4] D05B *27/04, 29/02*
U.S. Cl. 112—320 8 Claims



1. A presser foot lift device for an upper feed sewing machine, comprising:

a presser arm supported for rotation about an axis perpendicular to a cloth feed direction;

a presser foot secured to an end portion of said presser arm;

a feed arm rotatable about an axis parallel to a rotational axis of said presser arm and reciprocable in the cloth feed direction;

a feed tooth secured to an end portion of said feed arm in proximity to said presser foot;

a rocking mechanism for reciprocating said feed arm during operation of the sewing machine;

an actuating arm supported for rotation about the rotational axis of said presser arm;

connecting means arranged between said actuating arm and said feed arm for rotating said feed arm to lift said feed tooth above said presser foot during initial rotation of said actuating arm; and

actuating means connected with said actuating arm and presser arm for rotating said presser arm with said feed arm to simultaneously lift said feed tooth and presser foot with said feed tooth disposed above said presser foot during continued rotation of said actuating arm.

4,594,959
LOCKING DEVICE FOR REMOVABLE SEWING-MACHINE CONTROL CAMS

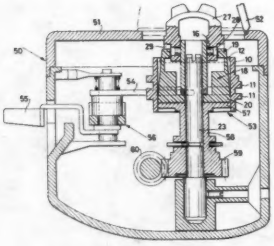
Giuseppe Valori, Monza, and Marco Primati, Cinisello Balsamo, both of Italy, assignors to Stabilimento Industriale Singer, s.r.l., Monza, Italy

Filed May 30, 1985, Ser. No. 739,111

Claims priority, application Italy, Jun. 12, 1984, 22251/84[U]

Int. Cl.[4] D05B *3/02*

U.S. Cl. 112—460 **2 Claims**



1. A locking device for sewing machine control cams having a plurality of cams formed on the outer surface of a substantially cylindrical support having an internal cavity, said device comprising a locking part fitted with coupling elements designed to be introduced in operative position in said internal cavity, said locking part being mounted on a kinematic rotation mechanism timed with said cam support, said support having an axial sleeve having a hole, a centering shaft having an end receivable in said hole, and a stop designed to releasably engage said coupling elements of said locking part, said stop comprising a U-shaped handle having sides, said axial sleeve having two aligned pins, said sides pivoted on said pins, said handle having stop teeth which upon rotation of said handle engage the connecting elements of the locking part.

4,594,960
LOW TIRE PRESSURE WARNING DEVICE WITH ATTACHED LID

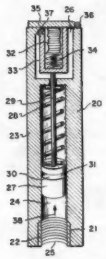
Henry Nalence, P.O. Box 490, R.D. #1, Lambertville, N.J. 08530

Continuation-in-part of Ser. No. 460,744, Jan. 24, 1983, Pat. No. 4,480,580. This application Sep. 10, 1984, Ser. No. 649,188

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.[4] B60C *23/04*

U.S. Cl. 116—34 R **10 Claims**



1. A low tire pressure warning device, comprising:

(a) a housing having an elongated chamber therein which has a closure thereon permanently attached during normal use, first end of which is connected to a tire valve so as to be capable of communication with the interior of a tire and a second and opposite end thereof capable of communication exterior of said tire;

(b) a spring-loaded piston mounted within said chamber, functionally connected so as to be axially movable within said chamber in response to changes in tire pressure, and so as to motivate a streamer upwardly and outwardly upon movement of said piston in response to a predetermined tire pressure decrease; and,

(c) a spring-mounted, colored warning streamer loated within said second end of said chamber and capable of being mounted in a compacted fashion therein, said streamer being connectively related to said spring-loaded piston and capable of being spring motivated to stream out of said chamber, as a warning signal, in response to axial piston movement in response to a predetermined decrease in tire pressure.

4,594,961
STAMP AND DEVICE FOR PROVIDING DROPS OF A VISCOUS LIQUID ON A SUBSTRATE

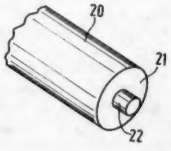
Petrus J. M. Beris; Jan J. Wondergem, and Hendrik J. Vledder, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1984, Ser. No. 676,116

Claims priority, application Netherlands, Dec. 6, 1983, 8304185

Int. Cl.[4] B05C *1/02*

U.S. Cl. 118—212 **12 Claims**



1. A stamp for providing a drop of a viscous liquid on a

substrate, said stamp comprising a body having an end face having a given cross-section and largest dimension selected for picking up and giving off the drop, the quantity of liquid in the drop being determined largely by the area of the face cross-section,

characterized in that the end face has a projection, said projection having a cross-sectional area which is less than one-quarter the area of the end face, and a height which is more than one-tenth and less than half said largest dimension.

4,594,962

APPARATUS FOR SPREADING GLUE ONTO SHEET-LIKE BLANKS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

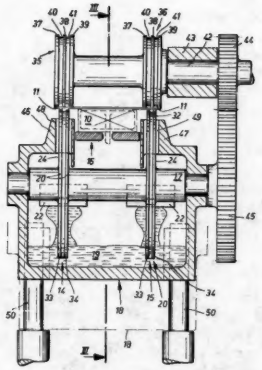
Continuation of Ser. No. 520,767, Aug. 8, 1983, Pat. No. 4,497,274, which is a continuation of Ser. No. 352,981, Feb. 26, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 684,314

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108089

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.⁴ B05C *1/02*

U.S. Cl. 118—221 **4 Claims**



1. An apparatus for applying glue to laterally extending flaps of a partially formed package comprising a glue container, a first shaft rotatably mounted within the glue container, a pair of glue applying rollers mounted on said shaft in axial spaced apart relation, conveyor means extending orthogonally with respect to said shaft and located between said rollers for supporting a partially formed package having a pair of oppositely extending lateral flaps adapted to engage the peripheral surface of said rollers, a second shaft disposed parallel to said first shaft, a pair of backing rollers mounted on said second shaft in axial spaced apart relation with said backing rollers being opposed to said glue applying rollers for engagement with said flaps, means for rotating said first and second shafts, cover means for said glue container disposed on opposite sides of said conveyor means, said cover means having aperture means through which the outer periphery of said glue applying rollers extend, and means for separating said glue applying rollers and said backing rollers to facilitate cleaning and repair work.

4,594,963

COATING DEVICE FOR COATING TRAVELING WEBS OF MATERIAL

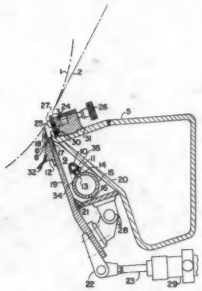
Frantz Krautzberger, Heidenheim-Grosskuchen, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,227

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337052

Int. Cl.⁴ B05C *5/02*

U.S. Cl. 118—610 **9 Claims**



1. A coating composition feeding apparatus for feeding coating composition to a web of material moving past said apparatus, said apparatus comprising:

a hollow feeding chamber having a slit-like opening through which coating composition located in said chamber may flow from said chamber to a web of material moving past said slit-like opening;

a hollow feed channel located in said feeding chamber, said feed channel having a plurality of coating composition discharge openings formed at spaced locations therein through which coating composition supplied to said channel under pressure may flow from said channel into said chamber; and a hollow discharge channel extending generally parallel to said feed channel and connected to said feed channel at a plurality of spaced locations along the length of said feed channel, whereby when said discharge channel and said feed channels are oriented with said discharge channel being located above said feed channel, gases entrained in said coating composition located in said feed channel can discharge from said feed channel to said discharge channel and thereby be removed from said coating composition;

said openings discharging said coating composition into said feeding chamber in a direction opposite to the location of said slit-like opening;

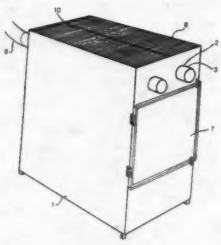
said discharge channel being connected to said feed channel via a plurality of transfer channels extending generally perpendicular to said axis of said feed channel and coupled to said feed channel and said discharge channel at spaced axial locations along the length of said feed channel.

4,594,964

METHOD AND APPARATUS FOR THE MASS REARING OF FRUIT FLIES

Roger I. Vargas, Honolulu, Hi.; Harold E. Mabry, McAllen, Tex.; Arthur L. Myers, Honolulu, and Richard M. Kobayashi, Kaneohe, both of Hi., assignors to United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 29, 1985, Ser. No. 696,222
Int. Cl.[4] A01K *67/00*
U.S. Cl. 119—1 12 Claims



1. An improved apparatus for the mass rearing of Tephritid fruit flies, comprising:

(a) a cage for housing fruit flies having openings for holding a tube;

(b) a tube extending lengthwise inside said cage which is made of a material which does not adversely affect fly oviposition, said tube having a solid bottom segment for holding sufficient water in said tube when the ends of said tube are closed to maintain a humidity in said tube of at least 80%, said tube having a perforated segment with a plurality of openings large enough for fruit flies to oviposit through, small enough so excessive water does not flow out of the openings when said tube is flushed with water, and of a size such that when the humidity in said tube is 80–100%, water evaporates out of said openings at a rate which causes the flies to be attracted to said openings and stimulated to oviposit, the spacing of said openings being close enough to maximize egg production and far enough apart to provide resting space for the flies; and

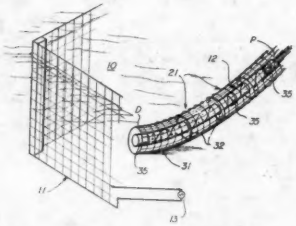
(c) means for opening and closing the ends of said tube.

4,594,965

SYMBIOTIC AQUA-CULTURE

Donald F. Asher, Jr., Harness Creek View Dr., Annapolis, Md. 21403; Otto J. Munz, deceased, late of Arlington, Va., and by Gerta H. Munz, Executrix, 600 S. 22nd St., Arlington, Va.

Continuation-in-part of Ser. No. 107,515, Dec. 29, 1979, abandoned. This application Aug. 5, 1981, Ser. No. 290,255
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 10 Claims



1. A marine husbandry system, comprising:

a conduit submerged in a body of water and having a plurality of tubes therein, each closed at one end and open at its other end, connected at their open ends with sources of fluids, and a plurality of outlet orifices communicating with each tube, connecting the tubes with the conduit exterior for discharge of fluid conducted by the tubes; and

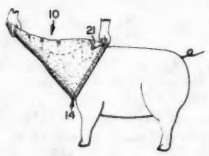
electrical field producing means comprising a pair of exposed, spaced electrodes carried by the conduit for creating an electric potential therebetween to attract and enhance the growth of marine life.

4,594,966

COLLAPSIBLE HEAD COVERING FOR ANIMALS

Michael D. Lynch, Box 85, Burbank, S. Dak. 57010

Continuation of Ser. No. 456,421, Jan. 7, 1983, abandoned. This application Jun. 15, 1984, Ser. No. 621,056
Int. Cl.[4] A01K *25/00, 29/00*
U.S. Cl. 119—130 6 Claims



1. A device for manually directing and controlling the rearward movement of a pig without attaching said device to the pig, said device comprising:

a covering constructed from a substantially light-impermeable, collapsible fabric, and having a first closed end and a second open end, said open end being generally circular and constructed to receive only the head of a pig, with said closed end being constructed to surround the nose of the pig; and

means, secured at said covering open end, for supporting and keeping said end in a constant open condition so that said device can be placed over the head of a pig and quickly removed, said means including a rigid ring substantially encased by said covering and sized to engage the shoulders of the pig to allow pressure to be exerted upon the shoulder area of the pig's body as the pig is guided thereby in a rearward direction with the pig's head being confined within said covering.

4,594,967

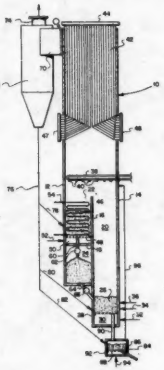
CIRCULATING SOLIDS FLUIDIZED BED REACTOR AND METHOD OF OPERATING SAME

Walter Wolowodiuk, Chatham, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Mar. 11, 1985, Ser. No. 710,725
Int. Cl.[4] B09B *3/00*
U.S. Cl. 122—4 D 13 Claims

1. A reactor comprising a housing, partition means for dividing said housing into threee chambers, grid means disposed in a first chamber, means for introducing a particulate fuel material to said grid means to establish a bed of said material, means for passing air through said bed to fluidize same and promote the combustion of said fuel, said air entraining a portion of said particulate material as it passes through said bed and said first chamber, means for separating said portion of particulate material from said air, additional grid means disposed in a second chamber, means for introducing said separated particulate material to said additional grid means to establish a bed of said separated particulate material, means for passing air through said bed of separated particulate material in said second chamber to fluidize same, means for cooling said bed of separated particulate material in said second chamber, means connecting said second chamber to a third chamber to permit the discharge of said separated particulate material to said third

chamber for storing same, means defining a fourth chamber, grid means disposed in said fourth chamber, means for introducing at least a portion of said separated particulate material



to said latter grid means to establish an additional bed of separated particulate material in said fourth chamber, and means for passing air through said additional bed of separated particulate material to fluidize same.

4,594,968

PROCESS AND DEVICE FOR DETERMINING THE COMPOSITION OF AN ALCOHOL-PETROL MIXTURE, ADAPTED TO THE AUTOMATIC REGULATION OF ENGINES FED WITH FUEL MIXTURES HAVING A VARIABLE ALCOHOL CONTENT

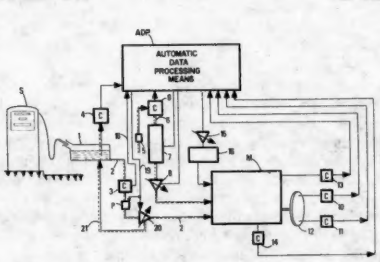
Paul Degobert, Rueil Malmaison; Michel Mauté, Les Clayes Sous/Bois, and Gerald Banet, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, France

Filed Mar. 5, 1984, Ser. No. 586,278

Claims priority, application France, Mar. 3, 1983, 83 03663

Int. Cl.[4] F02B *75/12*; G01J *1/00*

U.S. Cl. 123—1 A **13 Claims**



1. In a process for automatically adjusting operating parameters of a combustion engine fed with an alcohol-petrol mixture, a light beam is emitted through a mixture supplying the engine, the degree to which this beam is absorbed by the mixture is determined in a wave length band chosen in the wave length range of between 700 and 1700 namometers and an adjustment of the operating parameters of the engine is controlled as a function of the degree of absorption thus measured.

4,594,969

METHOD AND APPARATUS FOR PRODUCING A FUEL MIXTURE

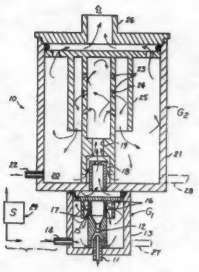
Aleksander Przybylski, 5801 SW. 47th St., Miami, Fla. 33155

Continuation of Ser. No. 307,318, Sep. 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 916,200, Jun. 16, 1978, abandoned. This application Jun. 20, 1983, Ser. No. 505,971

The portion of the term of this patent subsequent to Jan. 17, 2000, has been disclaimed.

Int. Cl.[4] F02M *25/02*

U.S. Cl. 123—25 E **10 Claims**



1. The method of producing a furel mixture for an internal combustion engine, comprising the steps of:

atomizing a carrier substance in a first step microaerosol generator to produce microaerosol particles thereof having a particle size in the range of from about 1×10^{-6}m to about 5×10^{-8}m;

atomizing fuel in a second step microaerosol generator;

causing all of the atomized carrier substance to flow through said second step microaerosol generator to entrian said atomized fuel; and

covering the carrier substance particles with a fuel film as the carrier particles and fuel pass through the second step microaerosol generator, thereby producing a homogeneous mixture of carrier substance and fuel, comprising particles of carrier substance with a fuel film thereon.

4. A carburetor for producing a microaerosol fuel mixture of a carrier substance and fuel, comprising:

a housing having first and second series-connected microaerosol generators therein;

said microaerosol generators each including labyrinth passage means through which the carrier substance and fuel are constrained to flow, respectively, whereby particles of the carrier substance and fuel repeatedly impact against the labyrinth passage means, causing the particles to break up, precluding flow therethrough of particles having a size greater than a predetermined range;

means connected with the first generator for supplying a carrier substance thereto for generating a microaerosol of carrier substance particles having a particle size in the range of from about 1×10^{-6}m to about 5×10^{-8}m, said particle size being within said predetermined range;

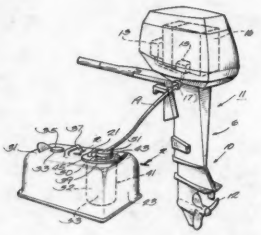
means connected with said second generator for supplying fuel thereto for generating a microaerosol of fuel particles; and

means for causing all of the microaerosol of carrier substance particles to pass through the fuel microaerosol generator, whereby the fuel forms a film on the particles of carrier substance, producing a homogeneous mixture of fuel and carrier substance.

4,594,970
MARINE INSTALLATION INCLUDING FUEL/OIL MIXING DEVICE

William W. Baars, Kenosha, Wis.; Gaylord M. Borst, Highland Park, Ill., and J. Michael Mahoney, Bristol, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 11, 1985, Ser. No. 700,550
Int. Cl.[4] F02B 33/04
U.S. Cl. 123—73 AD 65 Claims



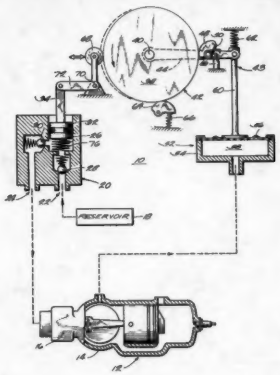
1. A marine installation comprising a marine propulsion device including a propulsion unit having a lower unit supporting a propeller and a powerhead including a two-stroke internal combustion engine having means for feeding a fuel/oil mixture to said engine and including a fuel/oil mixture pump having an inlet and being operable to create suction at said inlet, a flexible hose releasably connected to and communicating with said inlet of said fuel/oil mixture pump, and a remote tank having an interior providing a fuel reservoir, having a fitting releasably connected to said flexible hose, having a top wall including a first opening which is adapted to afford filling of fuel into said interior of said tank and which is adapted to removably receive a cap covering said first opening, and a second opening spaced from said first opening, and having an oil storing, oil pumping and fuel/oil mixing device located in said tank and including an upper wall closing said second opening and being secured to said top wall of said tank, and having therein an opening which is adapted to afford filling of oil into said oil storing, oil pumping, and fuel/oil mixing device and which is adapted to removably receive a cap covering said opening in said upper wall, an endless wall depending into said tank from said upper wall to partially define an oil reservoir communicating with said upper wall opening, and an oil pumping and fuel/oil mixing apparatus secured to said depending wall to form the bottom of said oil reservoir and including a first inlet communicating with said oil reservoir, a second inlet communicating with said fuel reservoir, and an outlet communicating with said fitting.

4,594,971
VARIABLE FUEL/OIL RATIO PUMP FOR TWO-STROKE INTERNAL COMBUSTION ENGINE

Gaylord M. Borst, Highland Park, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 26, 1984, Ser. No. 665,138
Int. Cl.[4] F01M 3/00
U.S. Cl. 123—73 AD 24 Claims

1. An engine apparatus comprising a two-cycle internal combustion engine including a crankcase that emits pressure pulses of variable amplitude and frequency, a lubricant reservoir, a pump having an inlet communicating with said reservoir and an outlet communicating with said engine, said pump including a reciprocating piston operable to pump lubricant from said reservoir to said engine at a flow rate that is a linear function of the frequency of reciprocation of said piston, a rotatable eccentric wheel including a cam surface, means engageable with said cam surface and communicating with said crankcase for rotating said wheel in response to said crankcase pressure pulses at an rpm that is a linear function of the pulse amplitude and of the pulse frequency, and means engageable with said cam surface for causing reciprocation of said piston

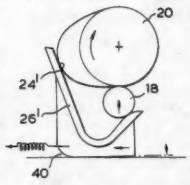


in response to rotation of said wheel at a frequency that is a linear function of the rpm of said wheel.

4,594,972
VALVE MECHANISM

Thomas T. Ma, Chelmsford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US84/00172, § 371 Date Feb. 8, 1984, § 102(e) Date Feb. 8, 1984, PCT Pub. No. WO84/03331, PCT Pub. Date Aug. 30, 1984
Continuation of Ser. No. 619,142, Feb. 8, 1984, abandoned. This PCT application Feb. 8, 1984, Ser. No. 793,727
Claims priority, application United Kingdom, Feb. 22, 1983, 8304880
Int. Cl.[4] F01L 1/30
U.S. Cl. 123—90.24 4 Claims



1. A valve operating mechanism for an internal combustion engine having a valve with a valve stem, a cam follower on the valve stem, and a cam shaft, all axially aligned with one another, comprising, the cam having a cam lobe thereon rotatable in synchronism with the engine crankshaft, the upper side of the cam follower being directly engagable by the cam lobe during one part of its rotation to move the valve stem and valve axially in an opening direction and disengagable from the cam lobe at other times to permit closing of the valve, and a movable one piece valve closing member contiguous to the under side of the cam follower and having a cam type projection spaced therefrom engagable by the cam lobe during another part of its rotation for moving the closing member in a direction to move the cam follower to close the valve, the closing member having an overall hook-like form with a V-shaped lower end surface engaging the underside of the cam follower, the projection being formed on a median portion of the hook-like member, the closing member being moved laterally by the cam follower upon engagement of the follower by the cam lobe forcing movement of the cam follower along the

V surface towards its apex to effect a direct vertical camming of the valve to an open position by the cam lobe through the cam follower.

4,594,973

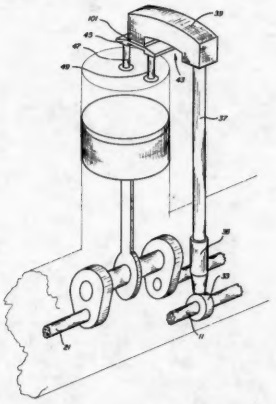
CROSS HEAD FOR INTERNAL COMBUSTION ENGINE

David Allred, Troy; Erwin Eichen, West Bloomfield, and James Flasck, Rochester, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 24, 1985, Ser. No. 748,281

Int. Cl.[4] F01L *1/18*

U.S. Cl. 123—90.40 **4 Claims**



1. A valve cross head adapted for mechanically translating valve opening impulses from the rocker arm to the valve stem of an internal combustion engine; said cross head comprising a metal body portion, a ceramic wear pad, a chemical vapor deposited film of a transition metal wettable by soldering and brazing alloys and adherent to the ceramic wear pad on the surface of the ceramic wear pad, and a bond between the transition metal surface of the ceramic wear pad and the body portion of the valve cross head.

4,594,974

SWITCHING ARRANGEMENT FOR GLOW PLUGS OF A DIESEL INTERNAL COMBUSTION ENGINE

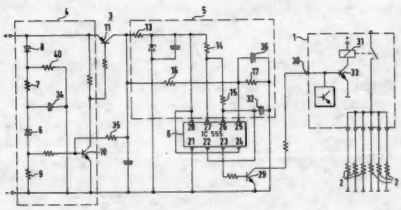
Dieter Nowak, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Continuation of Ser. No. 506,320, Jun. 21, 1983, abandoned. This application May 15, 1985, Ser. No. 734,753

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1982, 3224587

Int. Cl.[4] F02N *17/00*

U.S. Cl. 123—179 H **3 Claims**



1. A switching arrangement for glow plugs of a diesel internal combustion engine, the glow plugs being activatable at normal operating voltage for a relatively short period of time and in an uninterrupted fashion, comprising

means for monitoring operating voltage and

timing means activated in a series of cycles by the monitoring means for the intermittent actuation of the glow plugs at an operating voltage higher than the normal value,

a self-holding means for keeping the timing means activated during the entire preheating step, independently of a short-time drop of the operating voltage, wherein said means for monitoring operating voltage comprises

means for producing a delayed input to activate said timing means in response to receipt by said means for monitoring operating voltage of an operating voltage higher than normal.

4,594,975

GLOW PLUG CURRENT SUPPLY CONTROL SYSTEM

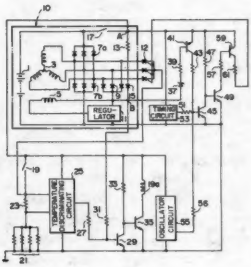
Hiromichi Shigenobu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 575,682, Jan. 31, 1984, abandoned. This application Jul. 31, 1985, Ser. No. 761,335

Claims priority, application Japan, Feb. 2, 1983, 58-15770

Int. Cl.[4] F02N *17/00*

U.S. Cl. 123—179 H **5 Claims**



1. A glow plug current supply control system in a diesel engine with a battery and an AC generator driven by said engine, comprising:

a rapid heating circuit for supplying current to a glow plug through a first switching element interposed between a key switch connected through a resistor with a low resistance value to said battery and said glow plug;

an after glow circuit for supplying current to said glow plug through at least one thyristor from an AC generator after starting said engine, wherein the anode of said thyristor is connected to an output terminal of said AC generator and the cathode of said thyristor is connected to said glow plug;

a first on-off control means for continuously closing said first switching element prior to the start of the diesel engine and continuously opening said first switching element after the start of the diesel engine owing to the generated voltage of the AC generator being higher than that of said battery; and

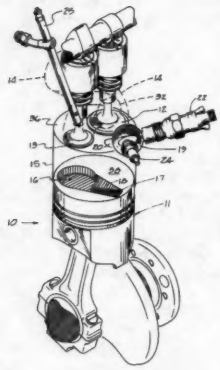
a second on-off control means including a circuit with an oscillator having an output connected to a gate terminal of said thyristor, for feeding a periodic signal to said gate terminal from said oscillator so as to periodically turn on-off said thyristor so that the voltage supplied to said glow plug is higher than that of said battery.

4,594,976

HYBRID INTERNAL COMBUSTION RECIPROCATING ENGINE

Cesar Gonzalez, Wichita, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Mar. 18, 1985, Ser. No. 712,726
Int. Cl.[4] F02B 3/00
U.S. Cl. 123—260 11 Claims



1. A hybrid type reciprocating internal combustion engine comprising:

a cylinder;

a cylinder head mounted on the cylinder having a substantially planar inner surface;

exhaust and inlet valves positioned in the head connected to corresponding exhaust and unthrottled inlet passages;

a piston reciprocally mounted within the cylinder having a top surface thereon which surface in the top dead center position of the piston is in close proximity with the inner surface of the head;

a precombustion chamber located in the head;

a lineal passage tangentially joining the precombustion chamber with the inner surface of the cylinder head;

a pilot fuel injector means and an igniter means both located in the precombustion chamber which inject and ignite a precharge;

a main fuel injector means in the cylinder head;

a bowl shaped recess comprising the main combustion chamber non-concentrically located in the top surface of the piston in close proximity with the main injector means in the top dead center position;

a first ramp means located in the top surface of the piston tangentially joining the main combustion chamber recess and substantially aligned with the said lineal passage, when the piston is approximately at the top dead center position, whereby the burning gases exiting the precombustion chamber are directed into the main combustion recess; and

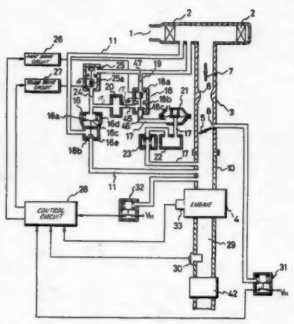
a second ramp means in the top surface of the piston laterally joining the first ramp means whereby the compressed gases, between the cylinder head and piston top surface as the piston approaches the top dead center position, flow down the second ramp means mixing with the burning gases flowing across the first ramp means causing ignition in the main combustion chamber.

4,594,977

SECONDARY AIR SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH DECELERATION CONTROL

Haruo Shimamura; Fumio Yatabe; Kunio Noguchi, and Tomohiko Kawanabe, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,647
Claims priority, application Japan, Nov. 30, 1983, 58-226418
Int. Cl.[4] F02M 23/08
U.S. Cl. 123—327 8 Claims



1. A secondary air intake system for an internal combustion engine having a primary air intake passage with a throttle valve and an exhaust system including: a secondary air intake passage communicating with the primary air intake passage downstream of a throttle valve, an air control valve disposed in said secondary air intake passage for changing the effective area of said secondary air intake passage in response to a pressure signal, means for determining an air-fuel ratio, a first control pressure source for generating a first control pressure for opening said air control valve; a second control pressure source for generating a second control pressure for closing said air control valve; and first pressure supply means for supplying said first and second control pressures so as to gradually increase or decrease the open area of said secondary air intake passage in accordance with said determined air-fuel ratio and for supplying said second control pressure independently of said determined air-fuel ratio at a predetermined engine operating state, wherein the improvement comprises second pressure supply means for abruptly supplying said second control pressure separately of said first pressure supply means in said predetermined engine operating state.

4,594,978

OVER-REVOLUTION PREVENTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Isao Kanno, Shizuoka, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Aug. 31, 1984, Ser. No. 646,565
Claims priority, application Japan, Sep. 1, 1983, 58-159056
Int. Cl.[4] F02P 9/00
U.S. Cl. 123—335 14 Claims

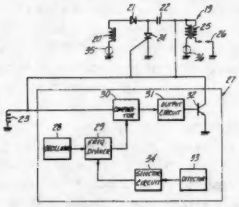
1. In an internal combustion engine which is capable of operating in a plurality of selectable operation states and has an ignition system, a revolution rate limiting apparatus, comprising:

means for generating a tachometer signal indicative of the revolution rate of said internal combustion engine;

means for generating a rate signal which is derived from an oscillator such that the frequency of the rate signal is responsive to the operation state of said internal combustion engine to determine the maximum revolution rate for each of said operation states;

means for producing a control signal which is responsive to a comparison between the frequency of said tachometer signal and the frequency of said rate signal; and

means for interacting with said ignition system to prevent a



sparking voltage from being induced in said ignition system in response to the value of said control signal until the revolution rate of said internal combustion engine decreases below the maximum revolution rate for the operation state that said internal combustion engine is in.

4,594,979

FUEL INJECTION RATE CONTROL SYSTEM FOR AN ENGINE

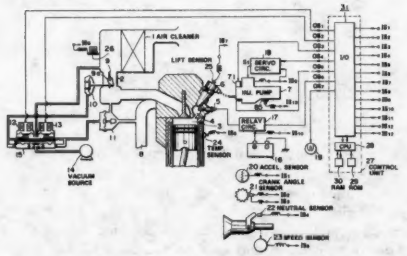
Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 6, 1984, Ser. No. 668,807

Claims priority, application Japan, Jan. 6, 1984, 59-646

Int. Cl.⁴ F02D *31/00*

U.S. Cl. 123—357 **5 Claims**



1. A fuel injection rate control system for an engine, comprising:

(a) means for injecting fuel into the engine;

(b) movable means for adjustably determining a rate of fuel injection into the engine, the fuel injection rate depending on the position of the movable means;

(c) means for detecting a critical position of the movable means defining a boundary between first and second ranges of the position of the movable means, fuel injection being performed in the first range and being disabled in the second range;

(d) means for sensing an operating condition of the engine; and

(e) means for controlling the movable means on the basis of the sensed engine operating condition and the detected critical position.

4,594,980

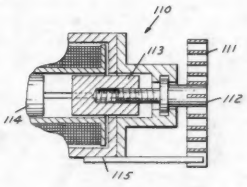
THROTTLE POSITIONING DEVICE

Charles A. Detweiler, Durand, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 419,740, Sep. 20, 1982, Pat. No. 4,463,716. This application Jul. 18, 1984, Ser. No. 631,990

Int. Cl.⁴ F02B *77/00*

U.S. Cl. 123—376 **1 Claim**



1. A positioning device comprising

a solenoid,

said solenoid having a plunger slidable upon energization of the solenoid,

a solenoid stop associated with said solenoid,

a stem operatively connected to said plunger,

an actuator connected to said solenoid stop an operable to move said stop to selected positions,

said actuator comprising a bi-metallic coil operable to thread the stem relative to said stop.

such that when the solenoid is energized, the plunger is moved to engage the stop and move the stem to a predetermined position, the extent of movement being determined by actuator of the actuator to move the stop to predetermined positions.

4,594,981

METHOD AND APPARATUS TO CONTROL IGNITION TIMING DURING STARTING OF AN EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINE

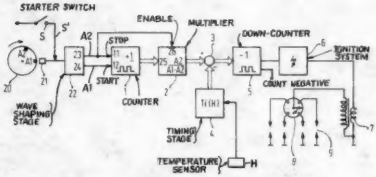
Erwin Gloss, Korntal; Edmund Jeenicke, Schwieberdingen; Gerhard Lotterbach, Markgröningen; Egbert Perenthaler, Stuttgart; Manfred Schenk, Schorndorf; Jan F. van Woudenberg, Markgröningen, and Udo Zucker, Bönnigheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 6, 1984, Ser. No. 647,701

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334389

Int. Cl.⁴ F02D *41/02*

U.S. Cl. 123—424 **3 Claims**



1. An apparatus to control ignition timing, during starting of an internal combustion engine (ICE) having a starter switch (S) providing a starting signal, and comprising, in accordance with the invention,

means (**20, 21, 22 1, 2**) for determining the projected time of occurrence of the upper-dead-center (UDC) position of a piston of the engine including:

a segmental disk (**20**) having a pair of markers (**A1, A2**);

a pickup (**21**) responsive to passage of the markers;

a wave-shaping stage (22) providing output signals representative of passage of any one of the markers (A1, A2) past the pickup (21);

a timing circuit (1) providing a time base to determine the time lapse between passage of the respective markers (A1, A2) past the pickup (21), and to permit extrapolation to determine said projected time of occurrence of a piston at the UDC position; and

computation means (2) computing said projected time of occurrence of the UDC position of the piston of the engine in accordance with an extrapolated relationship;

a timing stage (4) providing a predetermined time interval (Ti); an engine temperature sensor (H) coupled to said timing stage (4); means (5–9) for generating a spark discharge at a sparkplug; and

means (3) coupled to outputs of the computation means (2) and of the timing stage (4) and subtracting the timing interval (Ti) from the projected time of occurrence of the UDC position,

said subtraction means (3) being connected to and controlling the spark generating means (5–9) in accordance with the relationship:

$$T5 = T1 \cdot \frac{A2}{A1 - A2} - Ti(H)$$

wherein T5 is the actual timing instant when spark generation is triggered;

T1 is a number representative of the elapsed time between passage of the two markers (A1, A2) past the pickup (21);

A1 and A2 are representative of the respective angular positions, with respect to said UDC position, of the markers on said disk; and Ti(H) is a timing interval whose value is a function of engine temperature;

to cause generation of a spark said predetermined time interval in advance of UDC position of the piston, to place the maximum pressure of combustion always after the UDC position of the piston, regardless of speed of operation of the engine.

4,594,982

IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

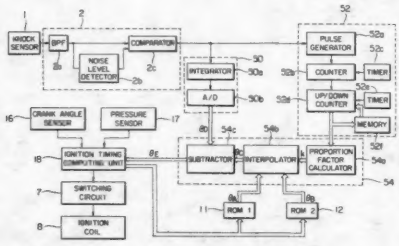
Akira Takahashi; Yoshiaki Danno, both of Kyoto; Toshio Iwata, and Atsushi Ueda, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,219

Claims priority, application Japan, Nov. 14, 1983, 58-213822; Nov. 14, 1983, 58-213823; Feb. 2, 1984, 59-18537

Int. Cl.[4] F02P *5/04*

U.S. Cl. 123—425 **31 Claims**



1. An ignition timing control apparatus for an internal combustion engine having a reference ignition timing comprising:

sensing means for sensing vibrations including knocks of said engine;

knock signal deriving means for deriving knock signals from the output of said sensing means;

correction magnitude determining means for determining from said knock signals derived by said knock signal deriving means an ignition timing correction magnitude for suppressing the occurrence of knock;

displacement magnitude determining means for determining from at least one of an output of said knock signal deriving means and an output of said correction magnitude determining means a displacement magnitude for said reference ignition timing corresponding to the octane rating of a fuel used in said engine; and

ignition timing determining means for setting the reference ignition timing at an optimum ignition timing angle for said engine responsive to the correction magnitude determined by said correction magnitude determining means and the displacement magnitude determined by said displacement magnitude determining means.

4,594,983

ENGINE OPERATING PARAMETER CONTROL APPARATUS

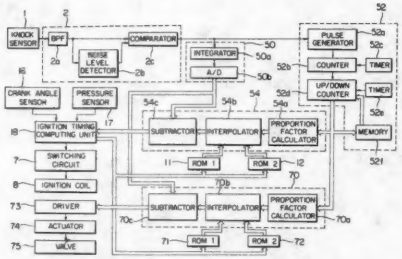
Akira Takahashi; Yoshiaki Danno, both of Kyoto; Toshio Iwata, Himeji; Atsushi Ueda, Himeji, and Takeo Sasaki, Himeji, all of Japan, assignors to Mitsubishi Jidosha Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,256

Claims priority, application Japan, Feb. 2, 1984, 59-18536

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—425 **15 Claims**



1. A control apparatus for an internal combustion engine having a reference ignition timing comprising:

a sensing means for sensing vibrations including knocks of said engine;

a knock signal deriving means for deriving knock signals from the output of said sensing means;

a correction magnitude determining means for determining from said knock signals derived by said knock signal deriving means an ignition timing correction magnitude for suppressing the occurrence of knock;

a displacement magnitude determining means for determining from at last one of an output of said knock signal deriving means and an output of said correction magnitude determining means a displacement magnitude for said reference ignition timing corresponding to the octane rating of a fuel used in said engine;

ignition timing determining means for setting the reference ignition timing at an optimum ignition timing angle for said engine responsive to the correction magnitude determined by said correction magnitude determining means and the displacement magnitude determining by said displacement magnitude determining means; and

operating parameter control means for controlling an operating parameter of said engine in addition to the ignition

timing of said engine in response to at least one of said correction magnitude and said displacement magnitude.

4,594,984

REGULATION DEVICE FOR THE MIXTURE COMPOSITION OF AN INTERNAL COMBUSTION ENGINE

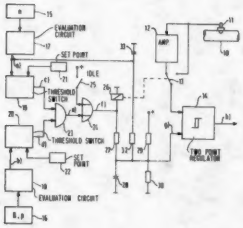
Lothar Raff, Remseck, and Hans-Martin Wiedenmann, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 708,094, Mar. 4, 1985, which is a continuation of Ser. No. 521,506, Aug. 8, 1983, abandoned. This application Jul. 15, 1985, Ser. No. 755,213

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231122

Int. Cl.[4] F02M *7/12;* **F02B** *3/08, 33/00;* **F02D** *5/02*

U.S. Cl. 123—440 **19 Claims**



1. A regulating device for controlling the mixture composition of an internal combustion engine having an oxygen sensor whose typical characteristic output signal is substantially linear in the vicinity of lambda equal to stoichiometric or 1 and has a steep gradient within a given voltage range, and varies therefrom in a rich peripheral range below stoichiometric and in a lean peripheral range above stoichiometric and has a shallow gradient in the peripheral ranges, comprising:

a two-point regulator means wherein the integral term output decreases with a constant slope when the air/fuel ratio is rich, and the integral term output increases with a constant slope when the air/fuel ratio is lean, said regulator means including an actual value input and a reference value input for providing a regulating mixture signal at its output;

a means for producing a set of discrete reference values for said regulator means wherein said reference values correspond to such values of said output signal which belong to the lean peripheral range above stoichiometric and to the stoichiometric range of said output signal;

a means for selecting one of said reference values as an input to said reference value input of said regulating means in dependence on the engine parameters of speed and load; and

a means for amplifying said output signal above stoichiometric to a usable signal magnitude for said actual value input to said regulator means, whereby said regulator means processes the lean peripheral range of said output signal.

4,594,985

METHOD AND APPARATUS OF LEARNING CONTROL FOR AIR/FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE TO AVOID STICKING TO LEAN OR RICH SIDE OPERATION

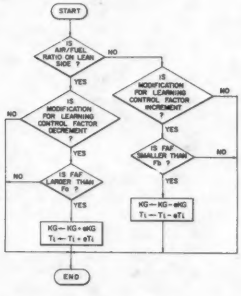
Kazushiro Fujimura, and Kazuyoshi Mizuno, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 28, 1984, Ser. No. 687,339

Claims priority, application Japan, Dec. 29, 1983, 58-247678

Int. Cl.[4] F02M *7/16*

U.S. Cl. 123—489 **12 Claims**



1. A method of learning control for air/fuel ratio of an internal combustion engine operated with fuel injection to maintain the air/fuel ratio at the stoichiometric value, comprising the steps of:

determining a basic fuel injection time duration according to engine load and engine revolution speed;

determining an air/fuel ratio feedback complementing factor which is changed over between a constantly increasing mode which continues as long as the air/fuel ratio is on the lean side of the stoichiometric value and a constantly decreasing mode which continues as long as the air/fuel ratio is on the rich side of the stoichiometric value;

determining a learning control factor;

multiplying said basic fuel injection time duration by said air/fuel ratio feedback complementing factor and further modifying said basic fuel injection time duration by said learning control factor so as to change in the same direction as said learning control factor changes to provide an actual fuel injection time duration,

wherein said learning control factor is obtained by initially setting said learning control factor at a predetermined initial value, calculating a mean value of each two successive end values of said air/fuel ratio feedback complementing factor in the constantly increasing and constantly decreasing modes thereof, increasing the current value of said learning control factor by a predetermined increment each time when said mean value is calculated to be larger than a predetermined first limit value, decreasing the current value of said learning control factor by a predetermined decrement each time when said mean value is calculated to be smaller than a predetermined second limit value which is smaller than said first limit value, maintaining the current value of said learning control factor each time when said mean value is calculated to be between said first and second limit values, and further increasing the current value of said learning control factor by a predetermined increment stepwise when and only when said air/fuel ratio feedback complementing factor is larger than a predetermined relatively large limit value; and

controlling the air/fuel ratio in accordance with said actual fuel injection time duration.

4,594,986

FUEL SUPPLY ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

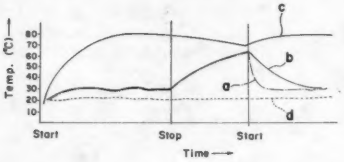
Shigeaki Shimoda; Masahiro Izuo; Yuji Nakao, all of Hiroshima; Masatoshi Shoji, Miyoshi, and Masamichi Iida, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 18, 1985, Ser. No. 692,639

Claims priority, application Japan, Jan. 20, 1984, 59-9217; Jan. 20, 1984, 59-9218; Jan. 20, 1984, 59-9219

Int. Cl.[4] F02N *17/08;* **F02M** *51/00*

U.S. Cl. 123—491 **21 Claims**



1. A fuel supply arrangement for an internal combustion engine, comprising:

an adjusting device for adjusting supply amount of fuel to said engine;

an air temperature sensor for detecting temperature of intake air, which is provided in an intake passage of said engine;

a correcting means for correctively controlling said adjusting device on the basis of an output of said air temperature sensor such that the supply amount of the fuel to said engine is decreased as the temperature of the intake air rises;

a detecting means for detecting a specific engine operating condition where a temperature of the intake air corresponding to the output of said air temperature sensor is higher than an actual temperature of the intake air; and a restricting means for restricting corrective control of said correcting means in response to a detection output of said detecting means, with the detection output representing detection of the specific engine operating condition.

4,594,987

FUEL INJECTION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

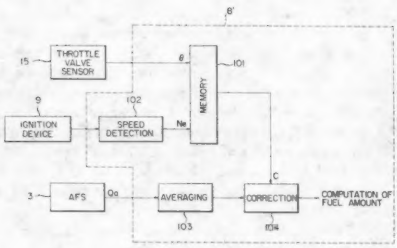
Seiji Wataya, Himeji; Yoshiaki Kanno, Kakogawa; Yukinobu Nishimura, Himeji; Setsuhiro Shimomura, Himeji, and Osamu Matsumoto, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1985, Ser. No. 704,578

Claims priority, application Japan, Feb. 27, 1984, 59-35542

Int. Cl.[4] F02M *51/00;* **G01F** *1/68*

U.S. Cl. 123—494 **5 Claims**



1. A fuel injection control apparatus for an internal combustion engine comprising a hot-wire type air flow sensor means for detecting the inlet air flow rate of said engine, a speed sensor means for detecting the rotational speed of said engine, a control means for computing a fuel amount to be supplied to said engine on the basis of the outputs of said air flow sensor means and of said speed sensor means, and a fuel injection valve driven by said control means;

said apparatus further comprising a throttle valve sensor means for detecting the opening of the throttle valve of said engine, and said control means including a correction means having means for storing therein a data map comprising correction factors as a function of an opening of the throttle valve and the rotational speed of said engine, and means for reading correction factors from said memory means and applying said correction factors for correcting the output of said air flow sensor means according to the openings of the throttle valve detected by said throttle valve sensor means and the speed of the engine detected by said speed sensor means.

4,594,988

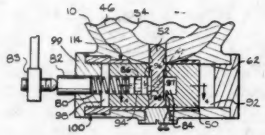
METHOD FOR BUILDING OR REPAIRING ROTARY INJECTION FUEL PUMP PISTON CYLINDERS

Martin J. Tompkins, Jr., 2430 Veltema, Holt, Mich. 48842, and Eugene G. Ash, 1406 121st Ave., Rte. 2, Hopkins, Mich. 49328

Filed Apr. 15, 1985, Ser. No. 723,267

Int. Cl.[4] F02M *59/20*

U.S. Cl. 123—502 **8 Claims**



1. In a rotary fuel injection pump for an internal combustion engine including a housing with inlet and outlet passages, a rotor having a longitudinal axis journaled in the housing having a rotor body with a plurality of angularly spaced radially extending bores and a fuel passage in communication with the inner ends of the bores having inlet and outlet ports which communicate alternately with said inlet and outlet passages during rotation of the rotor for alternately conducting fuel to and from the bores respectively, a plunger assembly for each bore comprising a pump plunger reciprocally mounted in the bore to sequentially receive charges of fuel from and deliver them to said inlet and outlet passages respectively, and a plunger operating roller and roller shoe at the outer end of the plunger having a radial position relative to the axis of the rotor, a cam ring with an inner cam contour surrounding the rotor in the plane of revolution of the rollers and engageable therewith to translate the cam contour into reciprocal movement of the plungers, and a plunger stroke limit mechanism for limiting the outward stroke of the plungers and thereby regulate the quantity of fuel injected during each inward pumping stroke thereof, a timing advance connector connected to the cam ring

for changing the radial position of the lobes in the plane of revolution of the rollers relative to the rollers to thereby advance or retard the fuel injection depending upon the position of the cam ring, a timing means controlling the movement of a hydraulic timing piston mounted in a cylinder which moves the connector, the improvement which comprises,

an aluminum sleeve with an inside wall providing the cylinder for the timing piston mounted in the housing, wherein the sleeve has a hard anodized coating on the wall adjacent the timing piston and wherein an outside wall of the sleeve is secured to the housing.

4,594,989

FUEL INJECTION PUMP

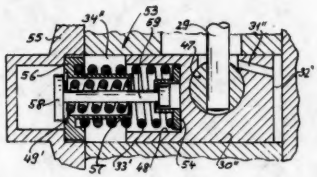
Helmut Laufer, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,173

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345155

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—502 **9 Claims**



1. A fuel injection pump, comprising a housing, a piston movable in said housing to supply fuel; a cam drive acting on said pump piston to move the latter and including a first rotatable part and a second part supported in said housing and turnable relative to the first rotatable part against a spring force for changing a supply start and thereby adjusting an injection start; a feed pump having a pump number of revolutions-dependent pressure; and adjusting piston loaded by the pump number of revolutions-dependent pressure of said feed pump and arranged to turn said second part relative to said first part of said cam drive; and spring means arranged to provide the spring force against which said second part is turnable relative to said first part of said cam drive, said spring means including a first stronger spring and a second weaker spring arranged so that said first stronger spring is always in engagement and in the region of lower numbers of revolution acts against said second weaker spring, and starting from a predetermined adjusting path and higher numbers of revolutions only said first stronger spring is active while said second weaker spring is disengaged and displaced as a block.

4,594,990

CARBURETOR FOR GASEOUS FUEL

William H. Batchelor, Hayesville, N.C., assignor to Propane Carburetion Systems, Inc., Stuart, Fla.

Filed Jun. 3, 1985, Ser. No. 740,814

Int. Cl.⁴ F02M *21/04*

U.S. Cl. 123—527 **31 Claims**

1. A gas fuel carburetor for an internal combustion engine having an air intake means including an intake manifold downstream of an air throttling means, comprising:

a housing through which engine intake air flows, including an air inlet end and an air/fuel mixture outlet end, and an air flow conduit extending between said ends;

a gas fuel manifold chamber within the housing;

a gas fuel receiving means in communication with said manifold chamber;

valve means for controlling the supply of gas fuel between said manifold and said air conduit, said valve means including relatively movable port and plug elements, relative movement between said port and plug elements varying the effective port opening of the valve means;

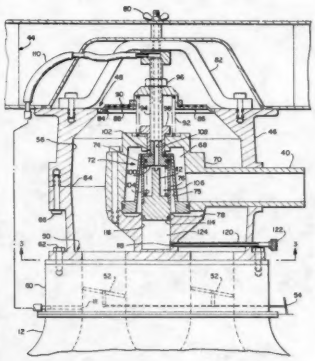
actuating means for the valve means comprising:

an air flow responsive member drivable in one direction by the force of intake air flowing through the housing;

connector means extending between the air flow responsive member and the movable valve element for moving said valve element in response to movement of the air flow responsive member;

spring biasing means for urging the air flow responsive member against the force of moving intake air; and

a lost motion and spring-bias connection between the connector means and the movable valve element arranged so that the connector means and movable valve element are normally maintained in predetermined geometric relationship with each other at a first end



stop position, but are movable relative to each other against a spring bias between the connector means and the movable valve element away from said first end stop position and up to a second end stop position;

movement of said air flow responsive member caused by air flowing through the housing towards the engine causing motion of said movable valve element in a direction to cause progressive opening of the valve means to provide communication between said gas manifold and said air conduit; and

means responsive to engine loading for varying the geometric relationship between the air flow responsive member and the movable valve element between said end stop positions in a manner such that the effective port area of the valve means is increased at higher engine loads for each driven position of the air flow responsive member during operation of the engine over its useful speed range.

4,594,991

FUEL AND WATER VAPORIZER FOR INTERNAL COMBUSTION ENGINES

Richard Harvey, 10828 Buggywhip Dr., Spring Valley, Calif. 92078

Continuation-in-part of Ser. No. 539,647, Oct. 6, 1983, Pat. No. 4,498,447. This application Feb. 11, 1985, Ser. No. 700,357

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—557 **2 Claims**

1. In combination with a gasoline-powered internal combustion engine, and fuel supply, an apparatus for injecting a fuel mixture of vaporized fuel, fuel, steam and air into the engine carburetor which comprises:

heated means for vaporizing fuel comprising:

a closed chamber having a fuel inlet, a vapor outlet, a

perforated septum lying horizontally across the lower half of said chamber;

a pipe passing through said chamber through which hot fluid derived from the engine cooling system is circulated; and

means associated with said inlet for spraying fuel against said septum;

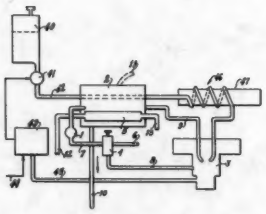
means for generating steam in proportion to the manifold vacuum created by the engine, wherein said means for generating steam comprises:

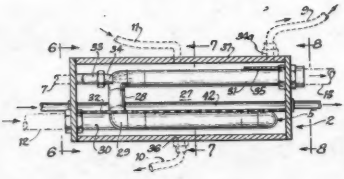
a supply of water;

a variable output water pump;

means for controlling the output of said water pump in response to the intake manifold vacuum generated by the engine; and

a heat exchanger to apply heat from the engine's exhaust manifold to the water delivered by said water pump,





said heat exchanger having a conduit leading from said water pump to said carburetor; and said conduit passing through said heated means and subsequently being intimately wrapped around a portion of the exhaust manifold of said engine;

means for delivering a portion of the fuel supply through said heated means, comprising:

a metering valve having an inlet port and first and second outlet ports;

an adjustable gate controlling the distribution of fuel admitted through said inlet between said outlet ports;

ducting means connecting said inlet port to a pressurized fuel supply, said first outlet port to the fuel inlet of the carburetor and said second outlet port to the fuel inlet of said chamber; and

conduit means for delivering steam from said means for generating and vapor from said means for vaporizing into said carburetor.

4,594,992

SUPERCHARGER OF AN INTERNAL COMBUSTION ENGINE HAVING ROOTS PUMP

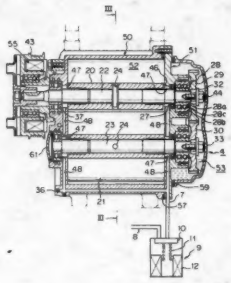
Norihiko Nakamura, Mishima, and Hidemi Ohnaka, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 26, 1985, Ser. No. 748,937

Claims priority, application Japan, Jul. 2, 1984, 59-135217

Int. Cl.[4] F02B *33/00*

U.S. Cl. 123—559 **5 Claims**



1. A supercharger of an internal combustion engine having a Roots-type pump:

a pump housing for defining therein a pump chamber having an inner wall and an air inlet and air outlet;

a pair of rotor shafts mounted in parallel and each rotatably supported in said housing by means of a pair of bearings, said rotor shafts respectively rigidly carrying rotors in such a manner that small clearances are defined between said pair of rotors, and between said rotors and the inner wall of the housing chamber;

means for rotating said pair of rotors synchronously in opposite directions so as to suck air from the air inlet into the pump chamber and discharge the air from the pump chamber through the air outlet;

each of said rotors having, at respective axial ends thereof, end faces substantially perpendicular to the rotor shaft;

said housing defining annular spaces around said rotor shafts and between said axial end faces of the rotors and said bearings; and

air passage means for connecting said annular spaces in the housing to the atmosphere, said passage means having a valve for controlling the air passage means in accordance with the engine driving conditions.

4,594,993

DEVICE FOR RECIRCULATING EXHAUST GAS IN AN INTERNAL COMBUSTION ENGINE

Gerhard Engel; Hans C. Engelbrecht, both of Stuttgart, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,533

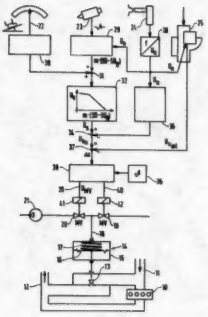
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1982, 3233290

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **12 Claims**

3. A system for recirculating exhaust gas in an internal combustion engine, particularly a self-ignition type engine, having an exhaust gas recirculation conduit provided with a first valve movable in two opposite directions between recirculation controlling positions, comprising a pneumatic adjusting device for adjusting a position of the first valve; two solenoid valves for selectively connecting the pneumatic adjusting device to a source of underpressure or to outer atmosphere, each of the solenoid valves having a solenoid winding; a control device

responsive to operational parameters of the engine to produce an energization signal for the windings of the two solenoid valves, said control device having a PID regulating behavior with limitations and a three-point switching circuit with a feedback connected to the two solenoid windings to actuate the two solenoid valves into one of three switching states, in a first switching state one of the solenoid valves is switched on,



the other solenoid valve is switched off and the position of the first valve is changed in one direction, in a second switching state the one solenoid valve is switched off, the other solenoid valve is switched on and the position of the first valve is changed in the opposite direction, and in a third switching state both solenoid valves are switched off and the position of the first valve remains unchanged.

4,594,994

CROSS-BOWS

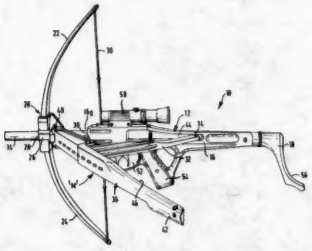
Ivan P. Williams, Huntingdon, England, assignor to Oakland Design Products Limited, Leamington Spa, England

Filed Feb. 29, 1984, Ser. No. 584,621

Claims priority, application United Kingdom, Mar. 4, 1983, 8306072

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—25 **7 Claims**



1. A cross-bow having a tiller including a forward portion and a stock, a prod mounted for reciprocal movement along said forward portion to facilitate cocking the bow and a cocking mechanism connected for operation as a slider-crank mechanism and comprising a connecting lever pivotally mounted to the prod and a crank lever pivotally mounted to the stock and to said connecting lever, and wherein, the pivotal connection between said crank lever and said connecting lever is located intermediate the ends of said connecting lever whereby that portion of the connecting lever which extends between its pivotal connection to the crank lever and its free end provides a grip portion which can be manipulated to operate the cocking mechanism.

4,594,995

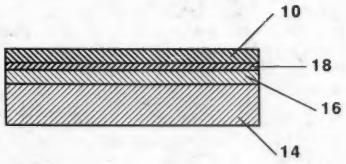
CARBONACEOUS SELECTIVE ABSORBER FOR SOLAR THERMAL ENERGY COLLECTION AND PROCESS FOR ITS FORMATION

John D. Garrison, 5607 Yerba Anita Dr., San Diego, Calif. 92115

Division of Ser. No. 449,606, Dec. 14, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 680,273

Int. Cl.[4] F24J *2/00*

U.S. Cl. 126—417 **27 Claims**



1. A method of constructing a solar selective absorber, comprising the steps of:

(a) depositing an infrared reflecting layer on a substrate;

(b) depositing a catalyst layer on said infrared reflecting layer; and

(c) depositing a carbonaceous layer on said catalyst layer by exposing said catalyst layer to a carbon containing gas compound at temperatures in the range of from 250° to 550° C.

13. A solar selective absorber of the type having a normal solar air-mass-two absorptance of greater than about 0.75 and hemispherical emittance at 100° C. of less than about 0.25 for selectively absorbing solar radiation in the range of about 0.3 to 2.0 microns while substantially reflecting infrared radiation and thus having low infrared emittance so that the heat loss after collection is minimized, comprising:

(a) a substrate;

(b) an infrared reflecting layer deposited on said substrate, said infrared reflecting layer having sufficient thickness to substantially prevent the transmission of light having wavelengths greater than 0.4 microns, and having a reflectance greater than 90 percent for infrared wavelengths greater than 1.0 micron;

(c) a catalyst layer deposited on said infrared reflecting layer said catalyst layer having a thickness of the order of 0.01 to 0.1 micron, and being a metal selected from the group consisting of group VIII metals and copper, for catalyzing the formation of carbon; and

(d) a carbonaceous layer pyrolytically deposited on said catalyst layer, said carbonaceous layer having a thickness of the order of 0.01 to 0.10 microns.

4,594,996

METHOD FOR REMOVING OBJECTS FROM TUBULAR BODY PASSAGES

Adel A. Ibrahim, 50 Camelot Dr., Huntington, W. Va. 25701; Kevin D. Linville, 6257 Sturm Rd., Huntington, W. Va. 25705, and Jerry E. Mays, 212 Short St., Huntington, W. Va. 25702

Division of Ser. No. 430,016, Sep. 30, 1982, abandoned. This application Jan. 31, 1985, Ser. No. 696,585

Int. Cl.[4] A61B *17/50*

U.S. Cl. 128—1 R **5 Claims**

1. A method for removing an object from a tubular body passage of a living being comprising the steps of:

introducing a relatively stiff ring, open at both ends, into the tubular body passage, moving the ring through the tubular body passage so as to allow contents within the passage to pass through the ring as the ring moves therethrough, said movement of the ring continuing until the ring surrounds a portion of the object to be removed, controlling said movement of the ring from the exterior of the body,

inflating a balloon which is located inside of the ring, while the balloon surrounds a portion of the object, such that the balloon inflates only inwardly, outward movement being restrained by the stiff ring,

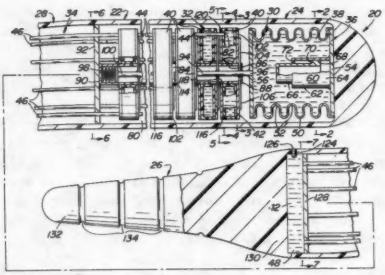
and withdrawing the ring out of the body passage with the object grasped thereby, to thus remove the object from the tubular body passage.

4,594,997

SELF ACTUATED PENILE IMPLANT

Said I. Hakky, 185 Dagenham Road, Rush Green, Romford, Essex RM7 OTL, England

Filed Nov. 13, 1984, Ser. No. 670,832
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—79 **35 Claims**



1. An implantable penile prosthesis comprising an elongated cylinder for disposition within the penis, said cylinder including a first portion adapted to move from a non-erect, flaccid state to an erect, rigid state, said prosthesis comprising actuating means including expandable means with a first fluid therein and energy applying means, said first fluid being in a first state occupying a first volume when said expandable means is unexpanded, said first fluid being changed to a second state capable of occupying a second volume greater than said first volume upon the application of energy thereto by said energy applying means for expanding said expandable means and causing said first portion of said cylinder to move to said rigid state, said fluid returning to its first state upon dissipation of said energy for causing said expandable means to return to its unexpanded condition and thereby cause said first portion of said cylinder to return to said non-erect, flaccid state, said energy applying means being operative for applying energy to said first fluid when an erection of said penis is desired and for ceasing to apply energy to said first fluid when it is desired to permit the penis to assume a non-erect, flaccid state.

4,594,998

PENILE PROSTHESIS OF IMPROVED MALLEABLE CONSTRUCTION

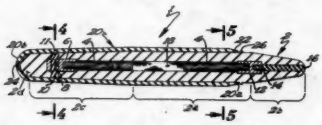
Christopher H. Porter, Minnetonka; Gregory D. Giter, Plymouth, and Robert W. Pugh, Jr., Lakeville, all of Minn., assignors to American Medical Systems, Inc., Minnetonka, Minn.

Filed Sep. 16, 1983, Ser. No. 533,527
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—79 **22 Claims**

1. An implantable penile prosthesis comprising:

an elongated, generally cylindrical insert member made of biocompatible, flexible material, said member being of integral construction and sized to extend over substantially the entire length of the corpus cavernosum of the penis within which it is inserted and said member having a distal tip of reduced diameter shaped to adapt to the glans penis and a proximal end constructed to anchor within the pubic symphasis;

an elongated, malleable rod fully enclosed and contained over its entire length within said cylindrical insert member and extending longitudinally therein, said malleable rod being bendable to various shapes and positions and having



the physical capability of holding any shape to which it is bent and having sufficient rigidity to hold a penis erect for sexual intercourse when in a straight position; and

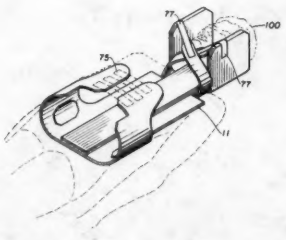
a thin walled sleeve of biocompatible material removably positioned over the outside of said cylindrical insert member in closely conforming, covering relation to at least the length of said insert member which will lie within the pendulous portion of the penis, and the walls of said sleeve having a predetermined thickness to provide a penile prosthesis of desired diameter as required for particular patients.

4,594,999

DISPOSABLE CERVICAL IMMOBILIZATION MEANS

William R. Nesbitt, Loomis, Calif., assignor to Nesbitt Enterprises

Filed Sep. 13, 1984, Ser. No. 650,206
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 R **13 Claims**



1. A disposable light weight radiolucent cervical spine board adapted to restrain the head and body of an injured person comprising

a flat, elongated, central member of a rectangular configuration, extending the length of the board,

a pair of head flaps, one of which extends outwardly on either side of said central member and which flaps are capable of moving from a first position in the same plane as said central member to a second position generally normally upward from said central member,

a pair of chin tabs, one on each side of the central member also extending outwardly from said central member and extending further than said head flaps, movable from the same first position through same second position to a third position inwardly toward each other, and adapted to serve as a hard collar for neck immobilization,

a pair of body portions, one on each side of said central member, said body portions including a flat support mem-

ber adjacent to said central member, and a wing member capable of moving from a first position in the same axis as the central member upwardly and inwardly toward the other of said wing members to a spaced relationship second position opposed to the other of said wing members, and wherein a score line separates the head flaps and chin tabs from the central section.

4,595,000

TUBULAR PESSARY AS A CONTRACEPTIVE MEANS

Jacques Hamou, 2 - Chaussee De LaMuette, 75016 Paris, France

Continuation-in-part of Ser. No. 553,466, Nov. 18, 1983. This application May 21, 1984, Ser. No. 612,758

Claims priority, application PCT Int'l Appl., Mar. 23, 1983, PCT/DE83/00047

Int. Cl.[4] A61F *5/46*

U.S. Cl. 128—130 6 Claims

1. A pessary for reversible contraception by obturating the isthmian channel, comprising: a body with a central part elongated along an axis and made from medically inert material, said central part having a cross-section normal to said axis with dimensions such that it forms a fluid-sealing fit with the wall of a fallopian tube in which it is inserted, said central part having a distal end and a proximal end; engagement means at said proximal end to be grasped to withdraw the pessary from the tube; and retention means extending from said distal end of said body, said retention means comprising an axially-extending support leg, and a barb arm, said support leg and barb arm forming a continuous structure with a springily flexible portion, said barb arm having a tip end which, in the relaxed unflexed condition of the flexible portion projects to a radial distance beyond the radius of the central part, whereby the tip end makes contact with said wall to resist removal of said pessary by peristaltic action, said barb arm being laterally retractable against the springy response of said flexible portion such that the tip end moves within said radius so the body and retention means can be fitted into a hysteroscope for insertion into the tube.

4,595,001

SURGICAL ADHESIVE DRESSING

William D. Potter, Bishops Stortford, and David A. Rawlings, Stansted Mountfitchet, both of United Kingdom, assignors to Smith and Nephew Associated Companies p.l.c., United Kingdom

PCT No. PCT/GB83/00104, § 371 Date Sep. 12, 1983, § 102(e) Date Sep. 12, 1983, PCT Pub. No. WO83/03549, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 8, 1983, Ser. No. 541,324

Claims priority, application United Kingdom, Apr. 8, 1982, 8210541

Int. Cl.[4] A61L *15/00*

U.S. Cl. 128—156 7 Claims

1. A dressing which consists essentially of a transparent bacteriaproof film of polyurethane which when hydrated contains 10% to 40% of water, which film has on one face an adhesive layer which allows 20 to 75% of the film to have access to water when the adhesive layer is in contact with water, which dressing has a MVP of not less than 3000 g/m^2 when the adhesive layer is in contact with water and has a MVP of not more than 2000 g/m^2 when the adhesive layer is in contact with moisture vapour but not water.

4,595,002

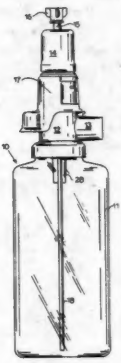
NEBULIZER

Thomas L. Michaels, Wonder Lake; Michael J. Finley, Park City, and Robert A. Virag, Cary, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 20, 1983, Ser. No. 544,023

Int. Cl.[4] A61M *11/02*

U.S. Cl. 128—200.21 1 Claim



1. A nebulizer, adapted to provide to a patient a nebulized mixture of a gas and a liquid, comprising:

a container for holding the liquid, said container having a neck;

a cap removably attached to said neck of said container, said cap having a dip tube, a liquid outlet, a first air inlet opening and a venturi passage, said dip tube extending into said container for withdrawing liquid from said container into said liquid outlet in said cap, said cap further having conduit means in communication with said liquid outlet and also in communication with said venturi passage in said cap, said cap further including a gas inlet in communication with said conduit means to accelerate gas in said conduit means past said liquid outlet and said air inlet and into said venturi passage to create a suction to draw liquid in said dip tube into said venturi passage to create said nebulized mixture of gas and liquid, said cap further having an outlet port for delivering said nebulized mixture to said patient;

dial means including a cylindrical primary wall having an inner surface mounted around said cap and having a second air inlet opening rotatable over said first air inlet opening to vary the size thereof, said dial means for controlling the concentration of air aspirated into said mixture, the position of said dial affecting a desired gas concentration; and

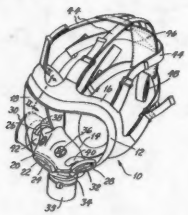
maintaining means for maintaining the position of said dial on said cap so that the position of said dial on said cap and said gas concentration is not inadvertently changed during operation of said nebulizer, said means including an outwardly extending squeezable hand grip disposed on said primary wall, said grip including an outer wall which extends generally parallel with said primary wall and opposite side walls which extend generally perpendicular to said outer wall and connecting said outer wall to said primary wall, said maintaining means being disengagable by the application of pressure on said opposite side walls of said grip, said maintaining means including at least two engagement ridges on said inner surface of said primary wall directly between said opposite side walls and at least one mating ridge on said cap for disengagable engagement with said engagement ridges in which squeezing said hand grip on said opposite side walls will cause said primary wall between said opposite side walls and therefore, said

engagement ridges to move away from said mating ridge on said cap to allow said dial to be selectively rotated on said cap.

4,595,003
PROTECTIVE MASK FOR AIRBORNE TOXIC SUBSTANCES

Charles J. Shoemaker, Baldwin; John A. Scavnicky, Joppa; Malcolm E. Little, Fallston; Emily M. Hagy, Kingsville, all of Md., and Aaron Bloom, Los Angeles, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 21, 1983, Ser. No. 544,144
Int. Cl.[4] A62B *7/00, 18/08*
U.S. Cl. 128—201.19 **11 Claims**



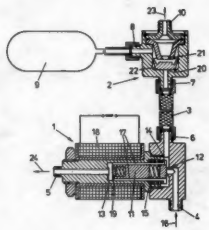
1. A protective mask comprising:
a one-piece face piece comprising a transparent visor and a sealing perimeter, said visor having disposed therein right and left respective openings over the cheek areas of a wearer, and lower central opening over the chin area of a wearer;
a filtration canister having an inlet and an outlet, a flexible hose having one end attached to the outlet of said canister;
voicemitter means effective to transmit a wearer's voice;
right and left cheek fittings mounted within said respective right and left openings with each including means adapted to be attached either to the other end of said flexible hose or to said voicemitter means;
said flexible hose other end being selectively attached to one of said cheek fittings, said voicemitter means being selectively attached to the other of said cheek fittings wherein said voicemitter means and said flexible hose are interchangeable between said left and right cheek fittings;
a chin fitting within said central opening in said face piece, an exhalation valve selectively attached to said chin fitting.

4,595,004
APPARATUS FOR THE TREATMENT OF THE LUNGS OF HUMANS OR ANIMALS

Kurt Czech, 13, Schwarzenbergplatz, A-1040 Vienna, Austria

Filed Sep. 17, 1984, Ser. No. 650,686
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.21 **11 Claims**

1. In an apparatus for treating the lungs of humans or animals including a source of pressure gas, a gas supply duct having one end having means adapted to be connected to said source and an opposite end having means adapted to be connected to a site of application, valve means in said gas supply duct, and means for actuating said valve means to open and close with frequencies of from 1 to 20 Hz for forming pressure shocks in said gas supply duct in a region of from 0.1 to 5 bar, the improvement which is characterized in said valve means comprises an active 3/2-way valve interposed in the gas supply duct and a passive 3/2-way rapid deaerating valve provided in the gas supply duct between the active 3/2-way valve and the site of application, said active 3/2-way valve having an inlet port connected to said duct leading from said source, an outlet port connected to said duct leading to said deaerating valve and an inlet/outlet port adapted to be connected to either a lower pressure source or to surrounding atmosphere, the passive 3/2-way rapid deaerating valve having an inlet port connected to said duct leading from said active 3/2-way valve, an outlet port connected to said duct leading to said site of application and an inlet/outlet port, a pressure vessel connected to

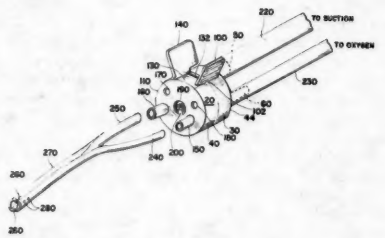


said inlet/outlet port, said passive 3/2-way valve also having valve means comprising a sealing body movable to and fro between two valves seats communicating with said inlet and outlet ports, respectively, whereby the passive 3/2-way rapid deaerating valve is adapted to alternately form a connection between the source of pressure gas and said pressure vessel, or between the pressure vessel and the site of application.

4,595,005
DUAL-PURPOSE CATHETER

Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08903

Filed Feb. 8, 1984, Ser. No. 577,986
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—205.24 **18 Claims**



1. A dual-purpose catheter comprising
a valve mechanism including a first end which is adapted to be coupled to a patient and a second end which is adapted to be coupled to a source of oxygen and a source of suction,
a suction tube and an oxygen tube extending from said second end of said valve mechanism and adapted to be connected to a source of suction and a source of oxygen, respectively,
a unitary two-part tube assembly including a first flexible tube and a second flexible tube coupled to the patient end of said valve mechanism, said first and second flexible tubes having patient ends remote from said valve mechanism,
said first and second tubes having flat wall portions along which said first and second tubes are secured together at the patient ends thereof, said wall portions of said first and second tubes facing each other and being parallel to each other,
said wall portions having first and second ends which are left and right ends, said left ends facing each other and said right ends facing each other,

means securing portions of said wall portions together but not securing together said wall portions at their facing left ends and right ends so that a space is present between the facing left ends and the facing right ends of said wall portions, the ends of said wall portions and the spaces between them forming generally U-shaped grooves,

said means comprising a thickening of said wall portions, said thickening being integral with said wall portions,

the ends of said wall portions and the spaces between the facing left and right ends thereof being able to engage and dislodge mucus which is present in the oral and tracheal passages of a patient when said unitary tube assembly is inserted into a patient, and

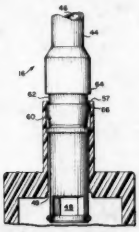
operating means in said valve mechanism for coupling together either said suction tube and one of said flexible tubes or said oxygen tube and the other flexible tube.

4,595,006

APPARATUS FOR CEMENTED IMPLANTATION OF PROSTHESES

Dennis W. Burke, 24 Marine Rd., South Boston, Mass. 02127, and William H. Harris, 665 Concord Ave., Belmont, Mass. 02178

Filed Aug. 16, 1982, Ser. No. 408,468
Int. Cl.⁴ A61F *1/00*
U.S. Cl. 128—303 R **12 Claims**



1. Apparatus for application of cement to a bone cavity for implantation of a prosthetic device comprising:

a generally rigid housing adapted to be sealed for pressurization thereof and for preventing a flow of gas therethrough, said housing holding a quantity of polymerizable cement prior to application to a bone cavity;

means for applying pressure to a quantity of cement disposed within said housing during polymerization thereof to minimize the formation of gas bubbles in the cement;

an elongated nozzle secured to said housing for delivery of cement to a bone cavity;

a valve coupling said nozzle to said housing, said valve being in a normally closed position during application of pressure to a quantity of cement within said housing by said applying means, said applying means urging cement through said nozzle and said valve into a bone cavity only when said valve is in an open position;

means for biasing said valve into said normally closed position, said valve being openable by a predetermined force to overcome said biasing means; and

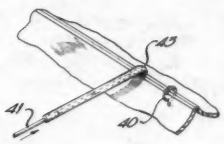
means for irreversibly locking said valve in said open position to prevent closure of said valve as cement is urged therethrough by said applying means.

4,595,007

SPLIT RING TYPE TISSUE FASTENER

Robert W. Mericle, Lebanon, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Mar. 14, 1983, Ser. No. 475,267
Int. Cl.⁴ A61B *17/00, 17/08*
U.S. Cl. 128—334 R **2 Claims**



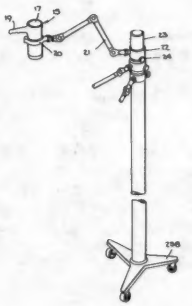
1. A method for joining tissue comprising approximating the tissue to be joined, inserting one end of a fastener through the approximated tissue, said fastener being formable into a given shape and capable of maintaining such shape once it has been formed, bending said fastener into a generally circular shape while said fastener is being inserted through the tissue, and simultaneously disposing said inserted end of said fastener laterally from the opposite end of said fastener while said fastener is being bent, whereby the tissue is joined by the maintained shape of the fastener.

4,595,008

LOCALIZED THERMOTHERAPY TECHNIQUE

Raul Guibert, Los Angeles, Calif., assignor to Sunset Ltd., Los Angeles, Calif.

Continuation-in-part of Ser. No. 313,313, Oct. 20, 1981, Pat. No. 4,461,299, which is a continuation-in-part of Ser. No. 274,504, Jun. 16, 1981, Pat. No. 4,398,535. This application Aug. 8, 1983, Ser. No. 521,262
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.⁴ A61F *7/00*
U.S. Cl. 128—399 **15 Claims**



1. A localized therapeutic hyperthemia or hypothermia technique for treating a problem region in the body of a patient which underlies a limited skin area without injury to the skin area, the technique comprising the steps of:

A. generating a high-velocity stream of air having a predetermined temperature level that deviates from the normal body temperature level of the patient so that a marked differential exists therebetween to promote rapid heat transfer; and

B. directing said stream to flow across said skin in a pulsatory wave pattern in a manner whereby no zone of said skin area is subjected to said stream for more than a rela-

tively brief pulse period during which said zone is exposed to said high-velocity air at said predetermined level, the pulse periods in said wave being separated by intervals during which the air over the skin area is relatively static, the intervals having a duration sufficient to permit rapid heat transfer to then take place between the skin area and the problem region to an extent preventing a deleterious change in the temperature of the skin area.

4,595,009

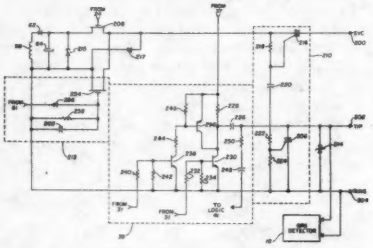
PROTECTION CIRCUIT FOR IMPLANTABLE CARDIOVERTER

Robert Leinders, Sittard, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 577,631, Feb. 6, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 781,567

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 D **7 Claims**



1. An implantable medical device for the electrical termination of an arrhythmic condition of the heart comprising:

first terminal means adapted to be coupled to first electrode means positioned in relation to a first portion of the heart;

second and third terminal means adapted to be coupled to second and third electrode means, respectively, positioned in relation to second and third portions, respectively, of the heart;

power source means for providing electrical power to said device;

means for detecting an arrhythmia of the heart and providing a trigger signal in response thereto, said detecting means coupled respectively to said second and third terminal means;

cardioversion energy pulse generating means for providing a cardioversion energy pulse in response to a trigger signal; and

protection circuit means responsive to the generation of a cardioversion energy pulse for electrically connecting said second and third terminal means together during delivery of a cardioversion energy pulse and for applying said cardioversion energy pulse between said first terminal means and said commonly connected second and third terminal means.

4,595,010

ELECTRICAL MUSCLE STIMULATOR

John C. Radke, Whitefish Bay, Wis., assignor to Bio-Research Associates, Inc., Milwaukee, Wis.

Filed Mar. 12, 1984, Ser. No. 588,379

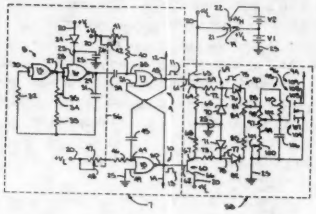
Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—421 **18 Claims**

1. A device to stimulate one or more muscles through first and second electrodes attached to a body, comprising

a pulse source electrically connected to said first and second electrodes to simultaneously supply a bi-polar pulse to each electrode having first and second phases which are a mirror image of the pulse supplied to the other electrode, and

means connected to said pulse source for differentially unbalancing said first and second phases to selectively provide unbalanced stimulation to one or more muscles through said first and second electrodes.



4,595,011

TRANSDERMAL DOSIMETER AND METHOD OF USE

Michael Phillips, 1740 Hinman Ave., Apt. 3B, Evanston, Ill. 60201

Filed Jul. 18, 1984, Ser. No. 632,127

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—636 **31 Claims**

1. A transdermal dosimeter for use in a diagnostic test which comprises:

(a) a sealed container constructed of chemically intert, flexible, fluid-tight, adhesive material;

(b) a dermal contact bridge in the container which comprises a fluid component and a support means component for supporting the fluid component within the container;

(c) a collecting component means in the container and in contact with the dermal contact bridge, for providing storage for fluid substances collected from the dermal contact bridge, said collecting component means being impregnated with an osmotically active crystalloid material; and

(d) a process component in the container made of fluid absorbent material containing a chemical reagent which reacts with the stored substances, said process component being in contact with the collecting component.

4,595,012

LUMEN MOUNTED ELECTRODES FOR PACING AND INTRA-CARDIAC ECG SENSING

William E. Webler, Santa Ana, and Clement Lieber, Yorba Linda, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 13, 1984, Ser. No. 570,632

Int. Cl.[4] A61B *5/04*; A61N *1/05*

U.S. Cl. 128—642 **16 Claims**

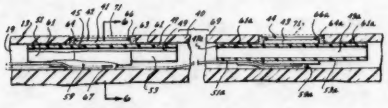
1. An apparatus for making electrical contact within the heart of a patient comprising:

an elongated tube sized to pass through a vein or an artery

and into the heart, said tube having proximal and distal ends, a peripheral wall, at least one lumen extending longitudinally within the tube and an opening in the peripheral wall which extends from the lumen to the exterior of the tube;

an electrode including a conductive member with a generally axial passage;

means at least partially within the lumen for mounting the electrode within said lumen with the electrode being exposed at said opening, said mounting means including a mounting member in said lumen, at least a portion of said mounting member being in said passage, extending into



said lumen and being displaced axially of the opening to at least assist in mechanically locking the conductive member in the lumen;

at least one conductive lead coupled to said electrode and extending from said electrode within said tube; and

said peripheral wall having an outer peripheral surface which extends along a major length of said tube with the outline of said peripheral surface over said opening forming a body line and said electrode extends radially outwardly no farther than said body line whereby said apparatus is no larger radially at the electrode than at regions lying axially of the electrode and the mounting means.

4,595,013

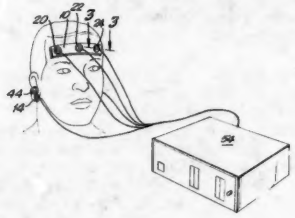
ELECTRODE HARNESS

Randolph W. Jones, Franklin, and Alfred S. Callahan, Nashville, both of Tenn., assignors to Neurologics, Inc., Nashville, Tenn.

Filed Aug. 17, 1984, Ser. No. 642,035

Int. Cl.[4] A61B 5/04

U.S. Cl. 128—644 **14 Claims**



1. A process for applying an electrode to a patient undergoing neurological monitoring, comprising the steps of

adhering a main, electrode-bearing portion of a flexible, adhesive-backed earpiece pad to a first side of an earlobe of said patient, said electrode-bearing portion sized to fit substantially over only said earlobe whereby said electrode in said main portion is in contact with said first side of said patient's earlobe;

bending a flexible appendage portion of said earpiece pad, connected to and extending substantially radially from said main portion, around the patient's earlobe; and

adhering at least an end of said appendage portion to the other side of said patient's earlobe opposite to said first side.

4,595,014

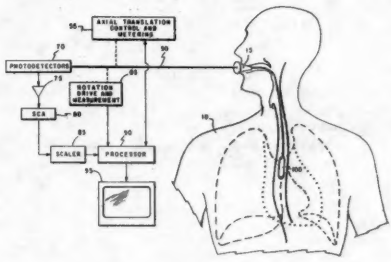
IMAGING PROBE AND METHOD

Harrison H. Barrett; Herbert B. Barber, and Walter J. Wild, all of Tucson, Ariz., assignors to University Patents, Inc., Westport, Conn.

Filed Oct. 18, 1983, Ser. No. 542,953

Int. Cl.[4] A61B 6/00

U.S. Cl. 128—654 **17 Claims**



4. Apparatus for imaging a radiation pattern from within a body, comprising:

a cable;

a minaturized probe coupled to the cable and insertable into the body, the probe including: a plurality of radiation detectors separated by parallel radiation-opaque axial collimators; each detector having an associated azimuthal collimator ring with a coded aperture pattern thereon, said collimator rings being disposed around their respective detectors, the coded aperture patterns of said collimator rings being at different relative rotational orientations;

means for obtaining output signals from said detectors for a series of positional translations of said probe; and

means responsive to said output signals for processing said output signals to obtain an image.

4,595,015

METHOD AND APPARATUS FOR ESTIMATING THE CARDIAC OUTPUT OF THE HEART OF A PATIENT

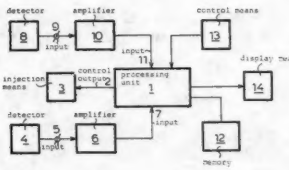
Jozef R. Jansen, Noordwijkerhout, and Adriaan Versprille, Rotterdam, both of Netherlands, assignors to Erasmus Universiteit Rotterdam, Netherlands

Filed Aug. 29, 1983, Ser. No. 527,419

Claims priority, application Netherlands, Apr. 18, 1983, 8301279

Int. Cl.[4] A61B 5/02

U.S. Cl. 128—713 **9 Claims**



1. A method for estimating the cardiac output of the heart of a patent comprising the steps of:

injecting an indicator as an impulse at a first position in the blood stream of the patent;

measuring a first signal corresponding to the concentration variation of the indicator at a second position at a distance downstream of said first position, said first signal being supplied to a processor unit;

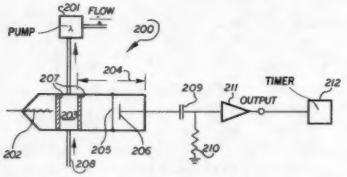
measuring a second signal at least substantially proportional to the cardiac output, adjacent said first position;
storing said first and second signals in a memory;
normalizing said second signal by a predetermined value to obtain a normalized second signal;
correcting said first signal by said normalized second signal to obtain a corrected signal; and
determining the cardiac output from said corrected signal by said processor unit.

4,595,016

APNEA MONITOR

Glenn H. Fertig, Natrona Heights, and Robert J. Wozniak, Belle Vernon, both of Pa., assignors to Mine Safety Appliances Co., Pittsburgh, Pa.

Filed Jan. 30, 1985, Ser. No. 696,392
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—719 **3 Claims**



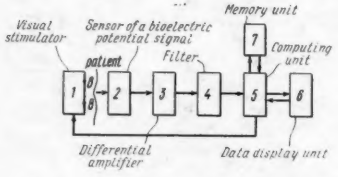
1. An apnea monitor comprising
a. Source means for producing an unmodulated beam of infrared radiation;
b. A sample cell in which fluid to be analyzed is contained, said sample being positioned in said unmodulated beam of radiation;
c. pneumatic detector means positioned to receive infrared radiation after passage through said sample cell;
d. means for drawing or pumping exhaled breath through said sample cell;
e. means for detecting the time between signals generated by said pneumatic detector; and
f. alarm means that is responsive to a significant delay between said signals.

4,595,017

METHOD FOR AUTOMATIC PROCESSING OF ELECTRO-OCULOGRAPHIC

Pavel A. Semenov; Svyatoslav N. Fedorov; Emilia M. Mironova; Eleonora V. Egorova, and Alexandr A. Karavaev, all of Moscow, U.S.S.R., assignors to Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza, Moscow, U.S.S.R.

Filed Mar. 20, 1985, Ser. No. 713,996
Claims priority, application U.S.S.R., Apr. 2, 1984, 3718819
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—733 **1 Claim**



1. A method for automatic processing of electro-oculographic signals, comprising the following operations:
visual stimulation of a patient at a preset angle and within a preset period of time;
recording the bioelectric potential signal of the examined patient's eye;
amplifying said signal of the bioelectric potential;
limiting the spectrum of said bioelectric potential signal;
measuring the amplitude of said bioelectric potential signal at preselected instants of time; said preselection of time instants at which the amplitude of the bioelectric potential is measured is carried out as follows:
determining the global extreme value of an absolute magnitude of the bioelectric potential within a predetermined number of stimulation cycles;
shaping a functional threshold signal associated with said global extreme value via a nondecreasing functional relationship;
dividing the entire measurement process that follows into a sequence of first equal time intervals, within each of which an integral signal I_i is shaped according to the following relation:

$$I_i = \int_{t_i}^{t_{i+1}} L_i(t)U(t)dt,$$

where:
t—running time ($t \in [t_i, t_{i+1}]$);
t_i—the left-hand bound of the running i-th first time interval;
t_{i+1}—the right-hand bound of the running i-th first time interval;
U(t)—spectrum-limited bioelectric potential signal;
$L_i(t)$—linearly varying signal symmetrical with respect to zero within the running time interval $[t_i, t_{i+1}]$;
comparing said integral signal I_i with said functional threshold signal;
isolating a second time interval bounded by the left- and right-hand bounds, respectively, of said first time intervals corresponding to the first time instants when the module of said integral signal I_i exceeds said functional threshold signal provided that the sign of said integral signal is reversed;
determining, within said second time interval, the running global extreme value of said bioelectric potential signal and the time instant when said signal reaches said value;
isolating a third time interval between said two adjacent global extreme values;
comparing said third time interval with said stimulation period;
fixing a preset number of said sequential running global extreme values provided every third of said time intervals between said adjacent global extreme value of the bioelectric potential signal is similar to said stimulation period;
comparing said fixed global extreme values of the bioelectric potential signal with one another;
discontinuing the measurement process of said compared global extreme values of the bioelectric potential signal are similar to one another;
statistical analysis of the fixed values of said amplitudes of the global values of the bioelectrical potential signal;
determining a constant electro-oculographic eye potential;
when the aforestated condition of similarity between said third time intervals and said stimulation period is not satisfied, the process of said measurement of the amplitudes of the bioelectric potential signals continues until all the aforementioned conditions are fully met within not more than a preset number of said stimulation cycles;
when the aforesaid condition of siimilarity between said global extreme values of the bioelectric potential signal is not satisfied the process of said measurement of the amplitudes of the bioelectric potential signals continues until all the aforesaid conditions are fully met within not more than a preset number of said stimulation cycles;
when only said condition of similarity between the values of

the amplitudes of the fixed extrema of the bioelectric potential signal cannot be satisfied within said preset number of said stimulation cycles, nonequiangular visual fixation is inferred;

when only said condition of similarity between said third time intervals and said stimulation period is not satisfied, said measurement process is repeated while gradually increasing the intensity of said functional threshold signal;

whenever the intensity of said functional threshold signal reaches a preset limiting value as a result of said gradual increases, inference is made that said constant electro-oculographic eye potential cannot be determined.

4,595,018

METHOD OF FURTHER DEVELOPING THE MEASURING OF A NEURO-MUSCULAR JUNCTION

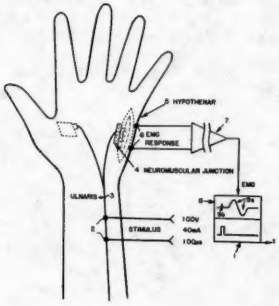
Börje Rantala, Helsinki, Finland, assignor to Instrumentarium Corp., Finland

Filed Jun. 6, 1984, Ser. No. 617,936

Claims priority, application Finland, Jun. 10, 1983, 832091

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—733 **2 Claims**



1. A method of enhancing the accuracy and reliability of neuromuscular block monitoring, comprising the steps of stimulating with electric pulses a given muscular nerve of a patient, measuring a corresponding muscular block by EMG, measuring a stimulus artefact caused by stimulation induced directly electrically and independently of a stimulus passing through said muscular nerve prior to the actual neuromuscular block, recording the value of stimulus artefact, monitoring changes of stimulus artefact values by measuring said stimulus artefact during measurements of a neuromuscular junction, and comparing the latter obtained stimulus artefact values with said first stimulus artefact values to control the state variations of NMT-measuring instruments and improve the reliability of measuring information.

4,595,019

STONE DISINTEGRATOR

William R. Shene, 7 W. Court St., Plattsburgh, N.Y. 12901, and Glen Brisson, 22358 Timberlea La., Kildeer, Ill. 60047

Filed May 4, 1984, Ser. No. 606,981

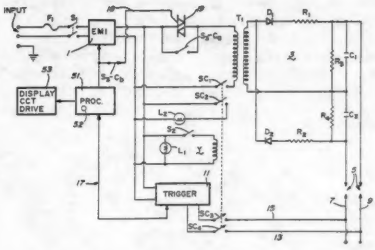
Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—734 **9 Claims**

1. In an instrument for attacking calculi of a patient in a liquid medium surrounding the calculi, said instrument including a lithotrite having a free, discharge, end, said free, discharge, end being disposed, in operation, adjacent the calculi being attacked, the improvement comprising:

means for detecting if said discharge end is adjacent to tissue of said patient;

said means for detecting being disposed at said discharge end whereby said means for detecting is disposed, in operation, adjacent said calculi being attacked; and



means for preventing operation of said instrument when said discharge end is adjacent said tissue.

4,595,020

DISPOSABLE PROBE FOR TEMPERATURE MEASUREMENTS IN HUMANS

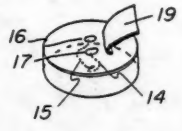
Yoram Palti, Haifa, Israel, assignor to Fidelity Medical Services, Inc., Millburn, N.J.

Filed Nov. 30, 1983, Ser. No. 556,548

Claims priority, application Israel, May 6, 1983, 68613

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—736 **4 Claims**



1. A disposable probe for temperature measurement, adapted to be attached to the skin of a person, comprising in combination thermo-sensitive means for measuring temperature, said thermo-sensitive means being shielded by a pad of closed pore foamed polymer or closed pore foamed rubber constituting an effective thermal insulation for the thermo-sensitive means, such that the probe can be used to measure internal body temperature, said thermo-sensitive means being connected by suitable leads to electrical contacts attachable by appropriate leads to sensitive means for measuring temperature, a metal plate with a central hole through which the thermosensitive means protrudes, being provided at a lower surface of said pad, said plate being of a size appreciably smaller than the size of said pad, and an adhesive layer being provided at the lower surface of said pad, for attachment of the probe to the skin.

4,595,021

BLOOD COLLECTOR

Atsushi Shimizu, and Toshiji Ichikawa, both of Tokyo, Japan, assignors to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 465,348, Feb. 9, 1983, abandoned. This application Jun. 4, 1985, Ser. No. 741,036

Claims priority, application Japan, Feb. 15, 1982, 57-22431

Int. Cl.[4] A61B *5/14*

U.S. Cl. 128—760 **14 Claims**

1. A blood collector, comprising:

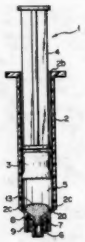
a cylindrical body having a closed end an open end;

a hollow body which is arranged at the closed end of said cylindrical body and which has a hole communicating with an interior of said cylindrical body;

collection means for communication with the hole of said hollow body;

a columnar body which is arranged within said cylindrical body to be in tight contact with an inner wall thereof and a distal end of which defines a blood collection space with the closed end of said cylindrical body, said columnar body having a hole which allows said blood collection space to communicate with the outside atmosphere;

a freeze-dried blood anticoagulant mass which is secured inside said blood collection space and tightly fixed to an inner surface of the closed end of said cylindrical body to block and close the hole of said hollow body, so that jet



currents of blood entering the hole of said hollow body under pressure are buffered by said mass, said mass being capable of being dissolved by the entering blood as the blood fills said blood collection space and, said mass having a permeability such that it allows gases to permeate therethrough; and

a filter which is arranged to laterally cross the hole of said columnar body, said filter being permeable to gases and impermeable to blood at least before being brought into contact with the blood which fills said blood collection space.

4,595,022

METHOD FOR PREVENTING REMANENCE PHENOMENA FROM INTERFERING WITH MAGNETIC FIELD SENSING SYSTEMS AND A DEVICE FOR IMPLEMENTATION OF THE METHOD

Wolfgang Schorr, Heppenheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

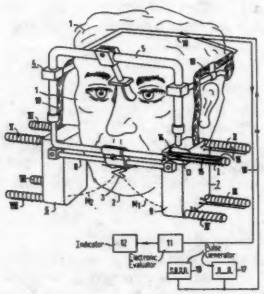
Division of Ser. No. 197,645, Oct. 16, 1980, Pat. No. 4,383,535. This application Feb. 8, 1983, Ser. No. 464,869

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944490

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.[4] A61B 5/10

U.S. Cl. 128—777 **14 Claims**



1. Apparatus for sensing magnetic field flux while preventing disruptive remanence phenomena, comprising at least one flux pickup with ferromagnetic properties for the detection of magnetic field flux and a change of magnetic field flux, pulse generator means for supplying a saturating magnetization pulse to the flux pickup, said saturating magnetization pulse having a characteristic such that the pulse amplitude and the pulse duration cause saturation of the flux pickup, and flux measurement means for measuring the magnetic field flux with the flux pickup after the supply of the saturating magnetization pulse to the flux pickup and during a period when the remanence of each pickup due to the saturating magnetization pulse is at a maximum.

4,595,023

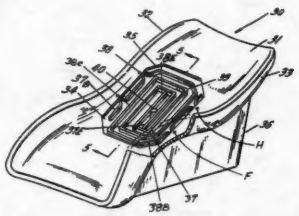
APPARATUS AND METHOD FOR DETECTING BODY VIBRATIONS

Kenneth Bonnet, 111 S. Centre Ave., Rockville Center, N.Y. 11570

Continuation-in-part of Ser. No. 321,804, Nov. 16, 1981, abandoned, which is a continuation of Ser. No. 68,610, Aug. 22, 1979, abandoned. This application Sep. 27, 1984, Ser. No. 654,986

Int. Cl.[4] A61B 5/10

U.S. Cl. 128—782 **20 Claims**



1. Body vibration sensing means comprising in combination:

a first support defining a body supporting portion adapted to be disposed beneath a living being to receive and support at least a portion of the weight of such living being,

said body supporting portion having an opening adapted to be disposed beneath the portion of the weight of such living being not supported by said body supporting portion,

spring means including at least one deflectable element which is cantileverily supported by said first support and extends into said opening in said body supporting portion of said first support in a manner to permit vibrational deflection of said deflectable element within said opening when body vibrations are imparted thereto from a living being supported above said body supporting portion,

transducing means for sensing variations in force applied thereto and operable to indicate such force variations by means of a variable output signal,

means for operatively coupling said deflectable element to said transducing means in a manner to permit the deflections of said deflectable element caused by variations in forces

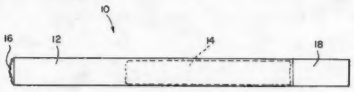
imparted thereto by a living being whose body is operatively coupled to said deflectable element to be sensed by said transducing means, and

indicating means controlled by the signal output by said transducing means for indicating deflections of said deflectable element caused by vibrations imparted thereto.

4,595,024
SEGMENTED CIGARETTE

Tammie B. Greene; David E. Townsend, and Thomas A. Perfetti, all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 31, 1984, Ser. No. 646,329
Int. Cl.[4] A24D *1/00*
U.S. Cl. 131—77 31 Claims



25. A method for producing a smoking article, said method comprising the steps of:

selecting a first tobacco segment;

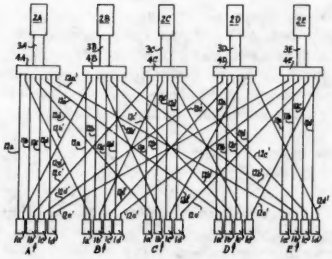
selecting a second tobacco segment having a density at least 20% greater than said first segment;

forming a tobacco rod from said first and second segments, said first segment occupying at least 30% of the length of said tobacco rod and positioned at the fire end of said tocacco rod; and said second segment positioned at the unlit end of the cigarette.

4,595,025
APPARATUS FOR REPLENISHING THE SUPPLIES OF FILTER ROD SECTIONS IN THE MAGAZINES OF FILTER TIPPING MACHINES

Günter Wahle, Reinbek, and Alois Kasparek, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 230,417, Feb. 2, 1981, abandoned. This application Jan. 4, 1983, Ser. No. 455,562
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238902
Int. Cl.[4] A24C *5/52*
U.S. Cl. 131—94 30 Claims

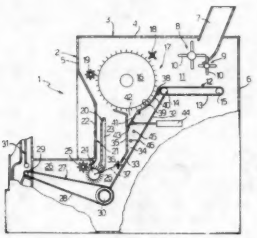


1. Apparatus for manipulating filter rod sections, comprising processing means including several filter processing machines, especially filter tipping machines, each having a magazine; conveyor means including first and second pneumatic conveyors for each of said machines and each having an inlet and an outlet; sender means including first and second pneumatic senders each having a source of filter rod sections and a plurality of propelling units, each propelling unit of said first sender being operable to deliver filter rod sections from the respective source to the inlet of a first conveyor and each propelling unit of said second sender being operable to deliver filter rod sections from the respective source to the inlet of a second conveyor; receiving means for transferring into said magazines filter rod sections supplied by the outlets of the respective first and second conveyors; and means for independently starting and arresting each propelling unit of each of said senders.

4,595,026
CIGARETTE MANUFACTURING METHOD AND MACHINE WITH SHORT TOBACCO DISTRIBUTION CONTROL

Riccardo Mattei, Bologna, Italy, assignor to G.D Societa' per Azioni, Bologna, Italy

Filed Dec. 10, 1984, Ser. No. 679,690
Claims priority, application Italy, Dec. 20, 1983, 3661 A/83
Int. Cl.[4] A24C *5/14, 5/39*
U.S. Cl. 131—109.1 5 Claims



1. Method of manufacturing cigarettes and controlling the distribution of short tobacco, whereby shredded tobacco, comprising both long and short tobacco, is fed on to a collecting belt (27) at the input of a unit for producing a continuous cigarette rod, the said method comprising stages consisting in:

dividing a mass of shredded tobacco, at a point upstream from the said collecting belt (27), in such a manner as to separate the long and short tobacco;

feeding the said long tobacco along a first route and, via extracting means (24), on to the said collecting belt (27) so as to form, on the said belt, a first essentially continuous stream of tobacco;

feeding the said short tobacco along a second route comprising first (42) and second (34) containers arranged in line, said first container (42) having an adjustable section outlet (43);

controlling the flow of the said short tobacco from the first to the second said container (42, 34) through said outlet (43), said flow being regulated by sensors (45) for detecting the tobacco level inside the said second container (34) so as to maintain the said level essentially constant; and

feeding said short tobacco on to the said collecting belt (27) in such a manner as to form on the same, together with the said first stream, a second continuous stream of short tobacco, the ratio of the latter in relation to the said stream being essentially constant and preset.

4,595,027
ROD WEIGHT CONTROL FOR A CIGARETTE MAKING MACHINE

Charles T. Higgins, and H. Neal Nunnally, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed May 8, 1984, Ser. No. 608,327
Int. Cl.[4] A24C *5/18*
U.S. Cl. 131—280 5 Claims

1. A rod weight control system for a cigarette making machine having a positionable ecreteur knife to adjust the quantity of tobacco fed to the rod forming section of the machine comprising:

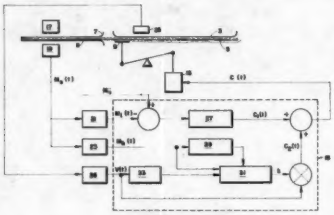
a rod density gauge to provide a signal indicative of the density of the formed tobacco rod;

a tobacco bed density gauge to provide a signal indicative of the density of the tobacco on the vacuum tobacco supply belt upstream of the ecreteur knife;

control means adapted to provide a first, long term feedback control signal in response to the signal from said rod density gauge and a second, high speed feed-forward

control signal in response to the signal from said tobacco bed density gauge;

summing means adapted to sum said first control signal and said second control signal to provide a continuous servo-control signal; and



high-speed servo means, aldapted for movement in response to said servo-control signal for positioning the ecreteur knife to maintain the cigarette rod density at the desired value.

4,595,028

VANITY CASE

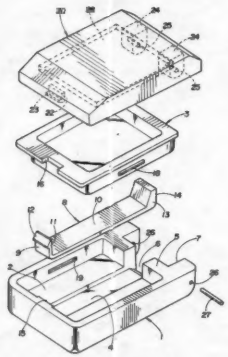
Yukitomo Yuhara, Abiko, Japan, assignor to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,842

Claims priority, application Japan, Dec. 24, 1982, 57-195165

Int. Cl.⁴ A45D *40/00*

U.S. Cl. 132—79 R **5 Claims**



1. A vanity case comprising:

a receptacle member having a recessed portion therein for containing cosmetic material and having a recess at a rear end thereof;

a cover member having a hinge block at a rear end thereof;

said receptacle member and said cover member being hinged together by fitting said hinge block into said recess;

a first latch means provided on the front inner surface of said receptacle member defining said recessed portion thereof;

a second latch means provided on the front lower surface of said cover member;

said first and second latch means being engaged with each other by snap action when said receptacle member is closed by said cover member, thereby maintaining said cover member in a closed position with respect to said receptacle member; and

a slide element slidably disposed in said recessed portion, said slide element having a tongue and a rear extension, said tongue extending upwardly from the front end of said slide element and being provided with an inclined outer surface, said inclined outer surface abutting the front end of said cover member when said cover member is in said closed position, said rear extension extending into said recess without contacting said hinge block, and said inclined outer surface, when said rear extension is pushed forwardly, forcing said cover member away from said receptacle member and releasing engagement between said first and second latch means, thereby moving said cover member to an open position.

4,595,029

ELECTRO-PNEUMATIC CONVERTER

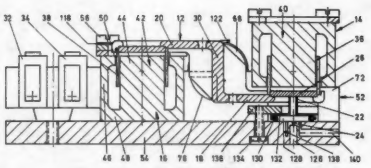
Günther Roth, Solingen, Fed. Rep. of Germany, assignor to Sunvic Regler GmbH, Solingen, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,424

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342857

Int. Cl.⁴ G05D *16/00*

U.S. Cl. 137—82 **8 Claims**



1. In an electro-pneumatic converter for converting an electric current into a pneumatic pressure, including a two-armed balance beam mounted by a pivot bearing (**10**) on a base (**52**), a telescoping coil system (**14**) mounted on one arm of the balance beam (**12**) and adapted for connection to an electric current to be converted, a nozzle (**22**) adapted for connection to a pneumatic fluid source through a restrictor (**24**) and located in front of a surface (**26**) of the balance beam to form a nozzle and baffle plate with the balance beam, the pressure ensuing at the nozzle counterbalancing a torque on the balance beam exerted by the telescoping coil system due to the electric current, the improvement comprising a second telescoping coil system (**16**) mounted on the opposite arm of the balance beam and adapted for connection to the electric current to be converted so that each telescoping coil system (**14, 16**) acts on the respective arms of balance beam (**12**) with the same sense of rotation, wherein,

(a) the beam of balance (**12**) is Z-shaped having a central portion (**30**) and two mutually parallel offset arms (**18, 20**) and

(b) the telescoping coil systems (**14, 16**) are arranged in the angles which are formed by the central portion (**30**) and a respective one of the arms (**18, 20**).

4,595,030

FUEL TANK FOR A WATER CRAFT

Mitsuhiro Yazaki, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Feb. 22, 1985, Ser. No. 704,204

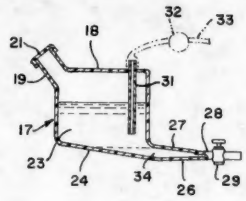
Claims priority, application Japan, Mar. 2, 1984, 59-30741[U]

Int. Cl.⁴ B01D *17/032*; B65D *25/54*

U.S. Cl. 137—203 **7 Claims**

1. A fuel tank comprising a main container part, said container part including a bottom portion, and said container part including an extension defining a collection chamber which extends laterally from said container part, said extension including an upper wall which slopes downwardly, and at least part of said upper wall being made of a transparent or translu-

cent material, a portion of said upper wall adjacent said container part being above said bottom portion and part of said bottom portion extending to form the bottom wall of said extension.



4,595,031

TUBE SEPARATOR DEVICE

Hans Arens, Wertingen; Hans Kern, Vachendorf, and Richard Haslberger, Hufschlag, all of Fed. Rep. of Germany, assignors to Grunbeck Wasseraufbereitung GmbH, Hochstadt, Fed. Rep. of Germany

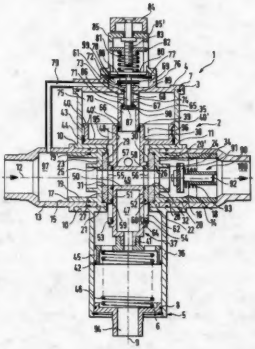
PCT No. PCT/EP83/00340, § 371 Date Aug. 10, 1984, § 102(e) Date Aug. 10, 1984, PCT Pub. No. WO84/02546, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 15, 1983, Ser. No. 641,956

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247323

Int. Cl.⁴ F16K *11/06*

U.S. Cl. 137—492.5 **8 Claims**



1. A tube separator comprising a housing having an inlet, an outlet and a drain opening, a slide valve member having a channel extending along an axis from said inlet opening to said outlet opening through said slide member and an area to be acted upon by the inlet fluid pressure.

a spring member acting on said slide member in a direction opposite to said fluid pressure.

said slide valve member being slidably supported within said housing in a direction transversely to said axis of said channel and to the axis of said inlet and said outlet between a first end position in which said channel forms a connection between said inlet and said outlet and a second end position in which said slide valve member separates said inlet from said outlet, said slide valve member comprising respective flat ceramic gasket elements disposed at both ends of said channel and being in fluid-tight engagement with a respective flat gasket element connected with said housing, said respective flat gasket elements being each connected to a part which is supported within said housing or said inlet and outlet, respectively, to be slidable in a direction which is substantially perpendicular to the sealing area of the flat gasket elements such that the part is urged onto the respective flat gasket element by means of the fluid pressure in the inlet and outlet, respectively.

4,595,032

VALVE CLOSING DEVICE

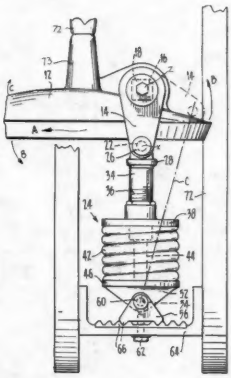
William Banks, Ballarat North, Australia, assignor to John Valves Pty., Ltd., Ballarat, Australia

Filed Feb. 14, 1984, Ser. No. 579,991

Claims priority, application Australia, Feb. 25, 1983, PF8204

Int. Cl.⁴ F16K *15/03, 31/56*

U.S. Cl. 137—527 **18 Claims**



1. A device for assisting closure of a valve element, said device comprising a closure member coupled to said valve element so as to rotate the valve element about an axis between a normally open position and a closed position, and biasing means coupled for relative movement to the closure member by a connecting pin, such that when the valve element is in an open position the closure member and biasing means are in a single generally straight line with the center axis of the connecting pin and the valve rotation axis, the closure member and the biasing means applying no torque to the valve element to move the valve when the valve element is in its usual open operational position and when the valve element commences to close, the closure member is moved relative to the biasing means so that the biasing means and closure member are no longer in a single straight line with the center axis of the connecting pin and the valve rotation axis and so that torque is continuously exerted by the biasing means through the closure member to assist closure of the valve.

4,595,033

LOW PRESSURE HIGH TEMPERATURE SAFETY VALVE

Richard D. Walsh, Jr., Pineville, La., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 537,881, Sep. 30, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 716,511

Int. Cl.⁴ F16K *17/12*

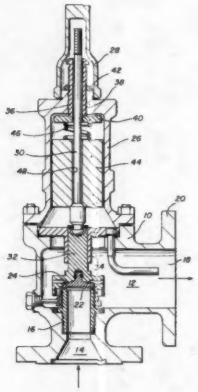
U.S. Cl. 137—529 **3 Claims**

1. In a safety valve for relieving overpressure of a fluid at temperatures of about at least 1000° F. including a body defining a fluid passage extending between an inlet and an outlet, an annular seat surrounding said passage at an intermediate location thereof and a disc displaceably movable from between an urged first position engaging said seat to prevent fluid flow therepast toward a second position removed from said seat to permit fluid flow to the outlet in response to a fluid overpres-

sure, the improvement for imposing the set point load force against said disc and comprising:

(a) an elongated spindle operably connected to said disc for displacement therewith;

(b) a mass of predetermined weight capable of imposing at least eight-five percent of the force sought to be imposed against said disc for urging said disc toward said closed position, said mass being of a stainless steel composition characterized by a relatively high mass per unit volume affording a relatively high order of thermal stability with a thermal conductivity substantially in the range of 6.85–21.4 Btu/h/ft^2/°F./ft and including a central bore through which to receive said spindle;



(c) support means to support said mass at a location physically displaced from said disc but in force-imposing relation thereagainst, said support means comprising means providing an engagement interference in a weighted direction between said mass and said spindle;

(d) a coil spring operably positioned in a series load relation with said mass for imposing the remaining load force sought to be imposed against said disc, said spring being positioned for relative temperature stability at a mass surface located furthest removed from the fluid passage in said body in relative thermal isolation from the temperature of said fluid passage as compared to said disc; and

(e) adjustment means to adjust the load imposed by said spring to calibrate the combined loading for the intended set point setting of said valve.

4,595,034

THREE-POSITION, FOUR-WAY, SHORT-STROKE ROTARY VALVE

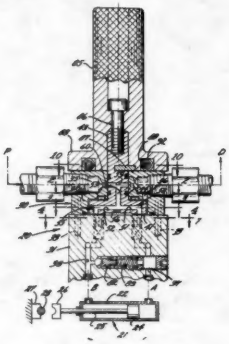
Roy C. Hutson, 1418 Sandy Hollow Rd., Rockford, Ill. 61109

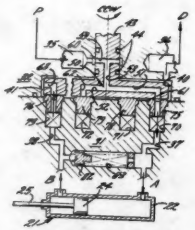
Filed Jul. 5, 1984, Ser. No. 628,152

Int. Cl.^{4} F15B *13/04*; F16K *11/06*

U.S. Cl. 137—625.21 **9 Claims**

1. A three-position, four-way rotary valve comprising a housing having a pressure port, a drain port and first and second outlet ports, a chamber defined within said housing, a valve member rotatably mounted in said chamber and rotatable in one direction through less than 45 degrees from a neutral position to a first active position and in the opposite direction less than 45 degrees from said neutral position to a second active position, said drain port communicating directly with said chamber in all positions of said valve member, first and second drain passages formed in said valve member and communicating with said drain port by way of said chamber in all positions of said valve member, said pressure port being sealed against direct communication with said chamber by said valve member whenever said valve member is in either of said active positions, a pressure passage formed in said valve member and having first, second and third branches which communicate with one another, the third branch of said pressure passage communicating with said pressure port whenever said valve member is in either of said active positions, said first branch pressure passage communicating with said first outlet port and said first drain passage communicating with said second outlet port when said valve member is in said first active position,





said second branch of said pressure passage communicating with said second outlet port and said second drain passage communicating with said first outlet port when said valve member is in said second active position, and means for closing off said second branch of said pressure passage when said valve member is in said first active position and for closing off said first branch of said pressure passage when said valve member is in said second active position.

4,595,035

SOLENOID VALVE

Frank G. Warrick, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Continuation of Ser. No. 577,853, Feb. 7, 1984, abandoned. This application Jun. 17, 1985, Ser. No. 744,670

Int. Cl.^{4} F15B *13/044*

U.S. Cl. 137—625.65 **18 Claims**

1. A normally closed solenoid valve comprising a valve housing including:

(a) a first transverse wall of magnetic material,

(b) an integral extension of magnetic material extending axially from said first transverse wall,

(c) an annular peripheral wall of magnetic material extending axially from the periphery of the first transverse wall in a direction opposite to the direction in which the axis extension extends,

(d) a pole member of magnetic material including a pole piece extending axially inwardly of the housing and

(e) a second transverse wall integral with and extending

raidlly outwardly from the pole member into engagement with the peripheral wall and connected thereto,

said pole piece having an axial passage therethrough,

said pole piece defining a first seat,

said first transverse wall and said axial extension of said housing having an axial passage aligned with the passage of said pole piece,

(f) an insert of non-magnetic material positioned in an axial opening in said axial extension and having an axial passage,

said insert defining a second seat,

(g) a ball of magnetic material interposed between the first and second seats and having limited movement between said seats and extending into said axial opening in said first transverse wall and said axial extension with a close fit to optimize the magnetic circuit,

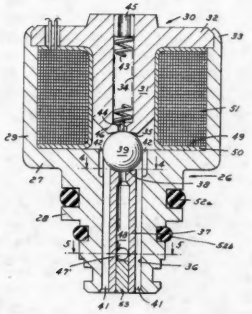
said axial passage in said pole piece having a narrow end portion forming the first seat, sais narrow portion is reduced in cross section as compared with the remainder of the passage,

spring means comprising a spring positioned in said axial passage of said pole piece and having projection yieldingly urged by said spring through said norrow portion of the axial passage to yieldingly urge said ball into engagement with the second seat,

said housing and pole member defining an annular space,

said insert having at least portions thereof spaced from the walls of the axial passage of the extension into which said insert extends defining passages communicating with the exterior of the axial extension,

a coil assembly in said annular space, such that when fluid is applied to the axial passage in said insert and the coil is de-energized, said spring means holds the ball against the second seat and prevents flow through said axial passage in said insert while permitting communication between the passages defined by the insert about the ball and first seat through the axial passage in the pole piece, and when the solenoid is energized, the ball is drawn toward the first seat to close communication to the axial passage in the pole piece and permit flow from the axial passage in the insert about the ball past the second seat and through the passages defined by the insert to the exterior of the axial extension.



4,595,036

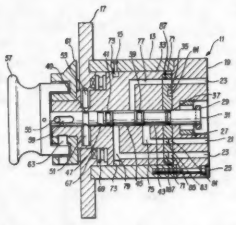
ROTARY CONTROL VALVE HAVING QUICK EMERGENCY EXHAUSTING MEANS

Charles F. Johnston, Fincastle, Va., assignor to Vitec Controls, Inc., Fincastle, Va.

Filed Feb. 14, 1984, Ser. No. 580,170

Int. Cl.[4] F15B *13/06, 20/00*

U.S. Cl. 137—636.4 **6 Claims**



1. A rotary control valve comprising:

a barrel housing having a plurality of circumferentially spaced exhaust openings therein;

a base plate having at least one inlet for admitting fluid and at least one outlet for discharging fluid; said base plate having a center opening surrounded by a notched-radially-outward ring for receiving a locking pin in a plurality of positions, said base plate being attached to said barrel housing;

a disc valve having a center opening and a concentric groove disposed at a first constant radial distance in a first face of said disc valve which is adapted to admit pressurized fluid from said at least one inlet; said disc valve having a pressuring aperture adapted to permit communication between said concentric groove and an opposite face of said disc valve; said disc valve having an exhaust slot disposed in said first face of said disc valve partially circumscribing said disc at a second constant radial distance, said disc valve having a second aperture in communication with said exhaust slot at a radial distance which is the same as said second constant radial distance; and a command communicating aperture adapted to permit communication between said first face and said opposite face of said disc valve; said command communicating aperture being at a radial distance which is the same as said second constant radial distance;

a spool valve; said spool valve having a first spool valve axial position and a second spool valve axial position;

a rotatable cylinder having a central opening therein; said rotatable cylinder having an annular channel adapted for communicating with said circumferentially spaced exhaust openings in said barrel housing; said rotatable cylinder having a first interior passageway for communication between said concentric groove and said central opening of said cylinder; said rotatable cylinder having a second interior passageway for communication between said central opening and a radially outward position on said disc valve at a radial distance which is the same as said second constant radial distance, wherein in said first spool valve axial position said second interior passageway can communicate with said first interior passageway and said command communicating aperture of said disc valve; said rotatable cylinder having a third interior passageway for communication in said first spool valve axial position between said central opening of said cylinder and said exhaust slot, but is not in communication with said second interior passageway of said disc valve; said third interior passageway extending to an outermost periphery of said rotatable cylinder for communication in both said first and said second spool valve axial positions between said

central opening of said rotatable cylinder and said annular channel;

in said second spool valve axial position said second interior passageway can communicate with said third interior passageway and with said command communicating aperture, and is not in communication with said first interior passageway;

said spool valve being disposed within said central opening of said cylinder, said central opening of said disc valve, and said central opening of said base plate; said spool valve having said locking pin fixed thereto for selective engagement with individual notches of said notched-radially-outward ring of said base plate; said spool valve, in combination with said rotatable cylinder, forming two axially disposed annular passageways removed serially from said locking pin;

said spool valve being axially movable within said rotatable cylinder between said first spool valve axial position and said second spool valve axial position;

said spool valve being fixed for rotation with said rotatable cylinder;

said spool valve in said second spool valve axial position, wherein said locking pin is not locked into a rotational position corresponding to permitting communication between said second interior passageway of said cylinder and said outlet port of said base plate, being in an axial position such that said first interior passageway of said rotatable cylinder is blocked; said spool valve in said second spool valve axial position permitting communication between said second interior passageway and said third interior passageway through a second one of said two axially disposed annular passageways; said spool valve in said first spool valve axial position, when locked into a rotational position corresponding to permitting communication between said second interior passageway and said outlet port of said base plate, being in an axial position such that said first interior passageway communicates with said second interior passageway through a first one of said two axially disposed annular passageways.

4,595,037

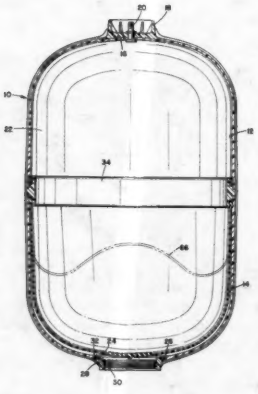
SPLIT TANK CLOSURE AND DIAPHRAGM ASSEMBLY

Edward T. LeBreton, Mentor; Arthur M. Kepler, Atwater, and Clyde W. Groves, Madison, all of Ohio, assignors to Essef Industries, Inc., Mentor, Ohio

Filed Dec. 14, 1984, Ser. No. 681,841

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—30 **4 Claims**



1. A hydropneumatic filament wound pressure vessel having a split tank closure and diaphragm assembly comprising first and second cup shaped plastic tank liners, said liners having oblate ellipsoidal end portions and cylindrical sidewall portions terminating in circular open mouth portions, said sidewall portions having recessed end portions, ring means for joining and sealing the open mouth portions together to form a sealed container, said ring means being defined by a cylindrical outer surface having an outside diameter corresponding to the outside diameter of the cylindrical sidewall portions of the liners, being defined by a pair of spaced intermediate cylindrical surfaces having end portions and an outside diameter corresponding to an inside diameter of the recessed end portions of the cylindrical sidewall portions of the liners, being defined by circumferential recesses at the end portions of the intermediate circumferential surfaces, and being defined by a pair of conical surfaces joining the cylindrical outer surface and the spaced intermediate surfaces and tapering radially inwardly toward each other from the outer surface to the intermediate surfaces, the open mouth portions being telescopically received on the intermediate circumferential surfaces and having end edges tapered to conform to said conical surfaces, an interface between the inner surface of a liner and one of said intermediate surfaces and an interface between the inner surface of a liner and the other one of said intermediate surfaces, the inner surfaces of said recessed end portions of said liners and said circumferential recesses forming a pair of circumferential grooves, an O-ring seal in one of said grooves sealing the interface between the inner surface of a liner and one of said intermediate surfaces, a flexible diaphragm separating the interior of said liners into discrete variable volume pressure chambers, the periphery of said diaphragm having a bulbous portion and being received in the other of said grooves sealing the interface between the inner surface of a liner and the other one of said intermediate surfaces, and a resin impregnated filament winding covering the liners and the outer cylindrical surface of said ring means in a predetermined winding pattern.

4,595,038

PRESSURE ACCUMULATOR AND VESSEL THEREOF

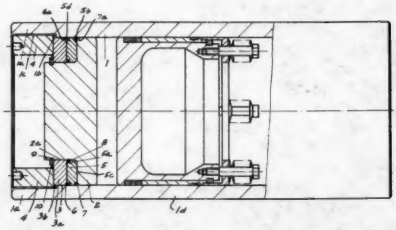
Manfred Wege, Gladenbach, Fed. Rep. of Germany, assignor to Bolenz & Schäfer Maschinenfabrik Zweigniederlassung der Rexnard GmbH, Bledenkopf-Eckelshausen, Fed. Rep. of Germany

Continuation of Ser. No. 462,931, Jan. 31, 1983, abandoned. This application Sep. 24, 1984, Ser. No. 654,054

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204205; Aug. 26, 1982, 3231723

Int. Cl.[4] F16L *55/04*

U.S. Cl. 138—31 **14 Claims**



1. A vessel of a pressure accumulator, especially for hydraulic systems in a control mechanism of electric high-voltage lines, comprising, a cylinder closable at its end faces and having a cylinder wall, the cylinder having an interior and a predetermined inner diameter; a lid for sealing off each end face of the cylinder, the lid including a cover plate which is inserted in tye cylinder and of such a shape that an annular recess is defined at its periphery, a cover member located in the annular

recess and concentrically surrounding a part of the cover plate, thereby defining a first annular groove between the cover plate and the cover member, and a sealing member disposed in the annular recess between the cover plate and the cover member and formed as a ring-shaped disk, the cover plate having at its peripheral area a first edge whereas the cover member has at its peripheral area a second edge facing each other and being tapered outwardly so as to form a first and second tapered groove of a predetermined depth so that the annular recess between the cover plate and the cover member widens towards the cylinder wall, the sealing member being formed as an annular disc of elastic material provided at its radially outer edge facing the cover plate with a first recess, at its radially outer edge facing the cover member with a second recess, with both said first and second recesses having a depth corresponding to the depth of the first and second tapered grooves, and its radially inner edge with a third recess; and supporting means for supporting said sealing member and including a first support ring provided within the first recess and the first tapered groove, a second support ring provided within the second recess and the second tapered groove, and a third support ring provided within the third recess, each support ring being of a deformable material ewsentially firmer than the material of the sealing member, each support ring having a cross-section corresponding to the cross-section of the respective spaces defined by the first recess and first tapered groove, second recess and second tapered groove and by the third recess, respectively.

4,595,039

METHOD AND DEVICE FOR CONTROLLING A PLURALITY OF RELAY NOZZLES IN A JET WEAVING MACHINE

Lars H. G. Tholander, Huskvarna, Sweden, assignor to Aktiebolaget Iro, Ulricehamn, Sweden

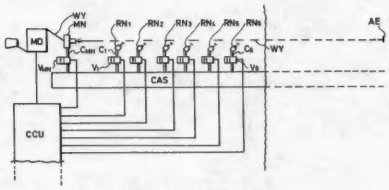
PCT No. PCT/SE83/00446, § 371 Date Aug. 8, 1984, § 102(e) Date Aug. 8, 1984, PCT Pub. No. WO84/02360, PCT Pub. Date Jun. 12, 1984

PCT Filed Dec. 12, 1983, Ser. No. 641,900

Claims priority, application Sweden, Dec. 10, 1982, 8207098

Int. Cl.[4] D03D *47/36*

U.S. Cl. 139—435 **13 Claims**



1. An apparatus for controlling a plurality of relay nozzles in a jet weaving machine, comprising control means for consecutively actuating said nozzles for supporting the insertion of a weft yarn into the shed of the weaving machine and up to the arrival end of said shed by consecutively opening solenoid valves associated with said nozzles, said valves being controlled on the basis of calculated information representing the momentary real position of the weft yarn during its movement through the shed, said weaving machine including a yarn storing, feeding and measuring device for the weft yarn to be supplied, said device including a stationary storage drum onto which an intermediate yarn store is wound by a winding-on member and from which the yarn is withdrawn spiralling around a withdrawal end of the storage drum, yarn sensing means arranged such that the weft yarn periodically passes its detection area during withdrawal from the drum, said yarn sensing means producing pulse signals, each said pulse signal indicating that the yarn is passing its detection area, and at least one yarn stopping device located at the withdrawal end of the storage drum and including a yarn stopping element and actuator means for moving said stopping element into and out of the path of the yarn being withdrawn, said control means including an actuator control device which has storing means for storing information regarding the yarn stopping device actuated at the end of the next preceding yarn withdrawal cycle and has calculating means for determining the momentary position of the withdrawal point of the yarn based on said stored information and on the periods of time between successive pulse signals from the yarn sensing means, said calculating means being electrically connected to said solenoid valves of the relay nozzles, and said calculating means transmitting a respective actuation signal to each of said nozzles for opening said nozzle at the moment when the calculated momentary position of the withdrawal point of the yarn on the storage drum corresponds to a length of the weft yarn being withdrawn which is equal to the distance of said nozzle from the insertion end of the shed of the weaving machine.

4,595,040

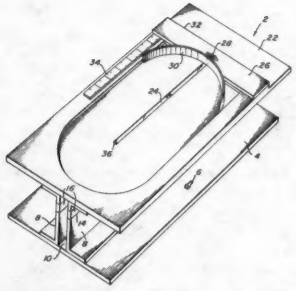
MORTISE AND TENON JIG

Rudy L. Glisman, 1350 Barbara, Selma, Calif. 93662

Filed Oct. 10, 1985, Ser. No. 786,054

Int. Cl.[4] B27C *5/10*; B65B *1/04*

U.S. Cl. 144—84 **9 Claims**



1. A jig for assisting in cutting a mortise and tenon from a workpiece, comprising

(a) a fixed, planar base plate;

(b) a pair of side walls connected with and arranged normal to said base, said side walls being arranged in a spaced parallel configuration defining a longitudinal channel adapted to receive the workpiece;

(c) a router guide plate connected with said side walls and being arranged spaced from and parallel to said base plate, whereby said channel is open at its ends and closed on its top and bottom by said router guide plate and said base plate, respectively, and on its sides by said side walls, said router guide plate containing a longitudinal through-slot extending above and affording communication with said channel; and

(d) guide means adjustably connected with said guide plate for sliding longitudinal displacement relative to said slot, whereby when the workpiece is arranged in said channel and said guide means is adjusted to a selected position, a routing device is positioned against one end of said guide means with its cutting tool arranged in and displaced relative to said slot to cut a mortise in the workpiece within said channel, and further when the routing device is positioned against the other end of said guide means with its cutting tool displaced relative to the end of said router guide plate, a tenon is cut in the portion of workpiece protruding from said channel.

4,595,041

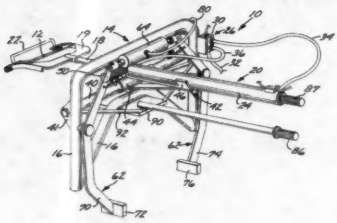
PORTABLE LOG PEELING APPARATUS HAVING A DRAW KNIFE

Robert A. Fox, 6601 Locus Rd., Pleasant Grove, Calif. 95668, and Clifford D. Hyatt, Auburn, Calif., assignors to Robert A. Fox, Pleasant Grove, Calif.

Filed Jul. 30, 1984, Ser. No. 635,667

Int. Cl.[4] B27L *1/06*

U.S. Cl. 144—208 D **6 Claims**



5. An apparatus for peeling a log with a hand hewn finish comprising:

(a) a frame; and

(b) a round slide bar mounted on said frame: and

(c) a cradle cylinder slidably mounted on said round slide bar; and

(d) a cradle bracket pivotally mounted on said cradle cylinder; and

(e) a cutter cylinder mounted on said cradle bracket; and

(f) a cutter rod slidably mounted in said cutter cylinder; and

(g) a cutter fork having two prongs connected to said cutter rod; and

(h) a draw knife swivel mounted between said two prongs of said cutter fork; and

(i) a power means connected to said cutter cylinder for driving said cutter rod alternately in and out of said cutter cylinder; and

(j) control means associated with said power means for controlling said driving of said cutter rod in and out of said cutter cylinder; and

(k) means connected to said frame for firmly attaching said frame to a log.

4,595,042

PNEUMATIC TIRE WITH LUGS

Hideaki Nishio, Wako, and Nobuo Shimizu, Kawagoe, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 688,158

Claims priority, application Japan, Mar. 28, 1984, 59-44781[U]

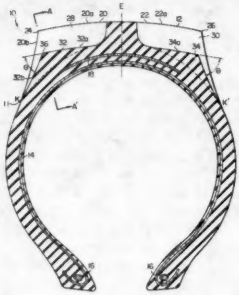
Int. Cl.[4] B60C *11/11*

U.S. Cl. 152—209 B **9 Claims**

1. A pneumatic tire, wherein the tire has a rotational axis thereof and a midcircumferential centerline between the lateral edges of the tread portion and includes, on the tread portion thereof, a series of lugs arranged circumferentially of the tire and grooves arranged between said adjacent lugs, comprising:

projections each of which is arranged in its corresponding groove between said lugs and smaller in height than said lug;

said each projection being spaced from said lugs a predetermined distance circumferentially of the tire and extending inwardly from its lateral edge and terminating short of said midcircumferential centerline and further extending outwardly from said lateral edge thereof and terminating in the side wall of the tire, and being gradually increased in height from the area of said midcircumferential centerline toward said lateral edge thereof and gradually decreased from the lateral edge toward the side wall of the tire.



4,595,043

SHUTTER DEVICE

Nobuaki Nozawa, and Koichi Kondo, both of Tokyo, Japan, assignors to Bunka Shutter Co., Ltd. and Lumitter Industry Co., Ltd., both of Tokyo, Japan

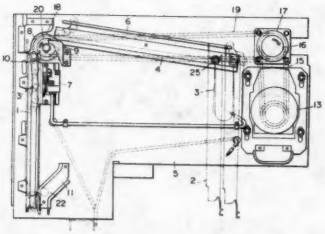
PCT No. PCT/JP84/00108, § 371 Date Jun. 18, 1984, § 102(e) Date Jun. 18, 1984, PCT Pub. No. WO84/03733, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 16, 1984, Ser. No. 621,926

Claims priority, application Japan, Mar. 16, 1983, 58-37919[U]; Mar. 16, 1983, 58-37920[U]; Mar. 16, 1983, 58-37921[U]; Mar. 16, 1983, 58-37922[U]

Int. Cl.[4] E04F *10/08*

U.S. Cl. 160—36 **3 Claims**



1. A shutter device for opening and closing an opening such as a building gateway, window or the like comprising means for moving up and down a plurality of panels which are engaged with guide rails disposed on both sides of said opening, part of each said panel being engaged with panel lift means to effect opening and closing motions of the panels, support rails for said panels disposed above said guide rails, and means for guiding said panels into positions where said panels are suspended from said support rails, each of said panels including upper and lower portions and pins projecting from said upper portions, said pins being inserted in attachments provided in predetermined positions on said panel lift means, said pins and said attachments being engaged together rotatably and movably in the thrust direction, said panel lift means comprising chains disposed on opposite sides of said opening, and further including sprockets disposed near the upper portions of said guide rails for engaging said chains to drive said chains, and chain-sprocket disengaging plates disposed adjacent the teeth of said sprockets for positively separating said chains from said sprockets during opening motion of said panels, each of said

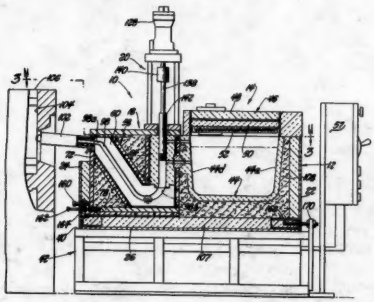
panels including an upper frame and a lower frame, each of said upper frames including a first extension projecting upwardly, each of said lower frames includes a second extension projecting downwardly, said first extension of one panel extending in overlapping relation with said second extension of an adjacent panel to enclose a gap between said adjacent panels.

4,595,044

DIE CASTING APPARATUS

William C. Caugherty, and Sydney H. Whitehorn, both of Birmingham, Mich., assignors to VSI Corporation, Pasadena, Calif.

Filed Apr. 10, 1984, Ser. No. 598,603
Int. Cl.[4] B22D *39/00*
U.S. Cl. 164—337 17 Claims



1. A die casting apparatus for delivering molten metal to a nozzle communicating with an inlet of a mold, said apparatus comprising:

(a) a source of molten metal;

(b) a shot barrel arranged to receive molten metal from said source; and

(c) a gooseneck assembly arranged to receive molten metal from said shot barrel for delivery to the nozzle and including:

(1) a holder comprising a plurality of plates;

(2) fastener means releasably joining said plates together to define an elongated, inclined gooseneck chamber;

(3) refractory insert means removably positioned within said gooseneck chamber and defining a central elongated gooseneck passage communicating at its lower inlet end with the lower outlet end of said shot barrel and at its upper outlet end with the nozzle;

(d) said holder plates, when releasably joined by said fastener means, further defining a generally vertical shot barrel chamber communicating at its lower end with the inlet of said gooseneck chamber;

(e) said shot barrel being refractory, being positioned in said shot barrel chamber, and including a central vertical bore communicating at its lower end with the inlet end of said gooseneck passage;

(f) said source of molten metal including a crucible having an inboard end wall and including a passage extending through said end wall and terminating in a seat in the exterior surface of said end wall;

(g) said apparatus further including

(1) a fitting passing through a inboard vertical plate of said holder and defining a central generally horizontal passage communicating at one end with the central vertical bore of said shot barrel, and

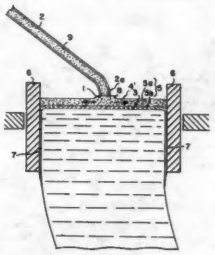
(2) a support structure including means mounting said holder for sliding linear movement in a direction to movement said inboard holder plate into juxtaposition to said crucible inboard end wall and move the free end of said fitting into said crucible seat to establish fluid communication between said crucible and said central shot barrel bore.

4,595,045

METHOD AND DEVICE FOR SUPPLYING AND CONTROLLING THE LAYER OF FLUX POWDER IN A CONTINUOUS CASTING MOLD

Michel Mangin, Fameck, and Patrick Bardet, Uckange, both of France, assignors to Societe Lorraine de Laminage Continu-Sollac (Societe Anonyme), Paris, France

Filed Feb. 28, 1983, Ser. No. 470,479
Claims priority, application France, Mar. 5, 1982, 82 03771
Int. Cl.[4] B22D *11/07*
U.S. Cl. 164—472 9 Claims



1. A method for maintaining a layer of powder material at a substantially even predetermined level above the surface of a metal bath in a continuous casting mold of the type where a liquid metal is conducted downward in a mold and the powder material is conducted through a supply pipe and onto a top surface of the metal, the supply pipe having a first end provided with a nozzle, the method comprising the steps of:

locating and maintaining the delivery nozzle at a level below top edges of the mold, and substantially at said predetermined level;

keeping the delivery nozzle open; and

providing a continuous supply of powder to the first end of the supply pipe;

whereby as powder is conducted through the nozzle, mounds of powder temporariy collect immediately below the nozzle and temporarily stop the flow of powder therethrough; and as the liquid metal is conducted downward through the mold, powder spreads transversely outward from the nozzle, the level of powder on the metal bath falls below said predetermined level, and powder directly below the nozzle spreads outward to restart the powder flow through the nozzle and to raise the level of powder on the liquid metal toward said predetermined level.

4,595,046

CONTROL APPARATUS FOR HEAT EXCHANGER

Takashi Iino, Fujimi, Japan, assignor to Taisei Kogyo Co., Ltd., Tokyo, Japan

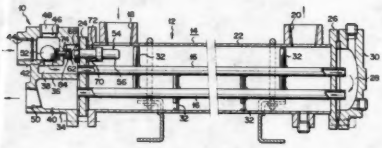
Filed Oct. 14, 1983, Ser. No. 542,205
Claims priority, application Japan, Dec. 11, 1982, 57-187620[U]
Int. Cl.[4] G05D *23/12;* B60H *1/00*
U.S. Cl. 165—39 3 Claims

1. A control apparatus for a heat exchanger, comprising a casing through which a first fluid flows and a tube disposed within said casing for a second fluid to flow therethrough, thereby allowing a heat exchange to occur between the first and second fluids; the control apparatus being so arranged as to change the flow rate of the second fluid in accordance with a change in temperature of the first fluid so as to maintain the temperature of the first fluid at a constant level, and being characterized by comprising:

a valve housing communicating with an inlet port of said tube and having a valve seat which is directed in a direction opposite to the direction in which the gravitational acceleration acts;

a spherical valve body loosely disposed in said valve housing and movable therein transversely of said valve seat between a closed position where said valve body is placed on said valve seat to prevent the second fluid from flowing into said tube of the heat exchanger and an open position where said valve body is separated from said valve seat to allow the second fluid to flow into said tube of the heat exchanger, said valve housing being configured such that gravity and the pressure of the second fluid flowing into said valve housing biases said valve body toward the closed position; and

a drive unit having:



a vessel mounted on said casing in such a way that part of said vessel is exposed to the first fluid which is flowing into said casing;

wax filled in said vessel and being expandable upon an increase in temperature;

an elastic sleeve member, one end of which opens toward said valve housing and the other end of which extends into said wax in said vessel so as to be surrounded by said wax, said elastic sleeve member being elastically compressible by the expansion of said wax; and

a rod having one end inserted into said elastic sleeve member and the other end extending into said valve housing in a direction substantially transverse of said valve seat, said rod being moved toward said valve housing upon the compression of said elastic sleeve member to move said valve body from the closed position to the open position against said bias.

4,595,047

DEVICE FOR ATTACHING AN ELEMENT FOR ROTATION IN A TUBE

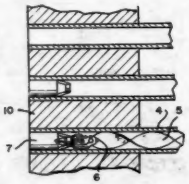
Patrick Estienne, Vernouillet, France, assignor to Elf France, Paris, France

Filed Nov. 7, 1984, Ser. No. 669,100

Claims priority, application France, Nov. 9, 1983, 83 17820

Int. Cl.[4] F28G *3/00, 15/08*

U.S. Cl. 165—76 **18 Claims**



1. Device for attaching an element for rotation in a tube, which comprises:

a tapered sleeve adapted for frictional engagement in said tube and including a fixed annular bearing, said bearing being associated with said sleeve by at least two arms, and said arms being inclined toward said bearing;

a hook including at least first and second lateral legs associated with each other by a major limb and a minor limb, said major limb being provided with an open bore and at least one flexible ratching tongue extending from said bore, and said first lateral leg being provided with an opening; and

a link-pin for interconnecting said hook and said sleeve while allowing the hook to rotate about its axis, wherein one end of the link-pin is provided with an annular bearing surface and the other end of the link-pin is provided with at least one lateral slot, and wherein portions of said link-pin are engaged in the annular bearing of said sleeve and other portions of said link-pin are engaged in the bore of said hook such that said ratching tongue is pressed in said lateral slot.

4,595,048

TRANSFER OF IMPACT FORCE ONTO HEATING OR COOLING SURFACES, AND DEVICE FOR EFFECTING SUCH TRANSFER

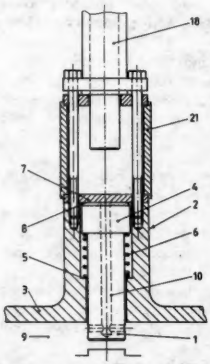
Gerd Pollak, Gummersbach, and Gerd Rabe, Meinerzhagen, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,503

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334456

Int. Cl.[4] F28G *7/00*

U.S. Cl. 165—84 **6 Claims**



1. In a transfer arrangement to transmit impact force from a mechanically, pneumatically, or hydraulically driven knock or impact-beating device, which is mounted externally of a container which receives dust-laden, hot, and/or contaminated gases, onto heating or cooling surfaces which are installed within said container, and which are to be intermittently cleaned;

the improvement therewith comprises means for indirect transfer of said impact force via a wall of said container to a striker which is pressed against an inner wall of said container via a resilient power accumulator.

4,595,049

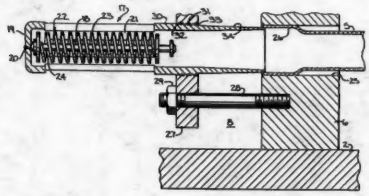
BASKET RETAINER FOR HEAT EXCHANGER TUBE CLEANING ELEMENT

Walter J. Baron, Milwaukee, and Laird C. Cleaver, Mequon, both of Wis., assignors to Water Services of America, Inc., Milwaukee, Wis.

Continuation of Ser. No. 505,077, Jun. 16, 1983, Pat. No. 4,552,207, which is a continuation of Ser. No. 350,286, Feb. 18, 1982, Pat. No. 4,398,592. This application Sep. 10, 1985, Ser. No. 774,284

Int. Cl.[4] F28G *1/12, 15/02*

U.S. Cl. 165—95 9 Claims



1. In combination in a heat exchanger having a housing, and having a plurality of longitudinally extending fluid flow tubes disposed within said housing, and having tube sheets disposed within said housing and with said tube sheets having openings in communication with the ends of said tubes, and further having longitudinally extending baskets for receiving shuttling tube cleaning elements mouthed in engagement with the ends of said tubes:

(a) a retaining plate fixedly disposed adjacent to the outer face of a said tube sheet,

(b) and means, including said retaining plate, mounting a said basket in fixed relationship to said tube sheet and to an end of a said tube.

4,595,050

HEAT EXCHANGER TUBE CLEANING ELEMENT CAPTURING DEVICE WITH RETAINER ROTATION PREVENTION

Walter J. Baron, Mequon, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 533,134, Sep. 16, 1983, abandoned, and a continuation-in-part of Ser. No. 533,143, Sep. 16, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 645,823

Int. Cl.[4] F28G *1/12*

U.S. Cl. 165—95 5 Claims

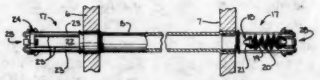
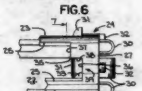


FIG.6



1. For use in a heat exchanger having a housing containing a plurality of fluid flow tubes arranged with exposed open ends, the combination comprising:

(a) an elongated basket adapted to capture a tube cleaning element propelled through the tube by fluid,

(b) said basket having a longitudinally extending central body portion comprising a fluid flow slot and ribs forming the side edges of said slot,

(c) a cleaning element retainer adapted to be removably mounted to the outer end of said basket and with said retainer including a flexible clip leg,

(d) and cooperative means disposed at the outer end of said slot and on said clip leg for fixedly holding said retainer stationary with respect to said basket when the retainer is mounted to said basket.

4,595,051

CASING FOR A HEAT EXCHANGER IN AN AIR-CONDITIONER, IN PARTICULAR FOR A VEHICLE CABIN

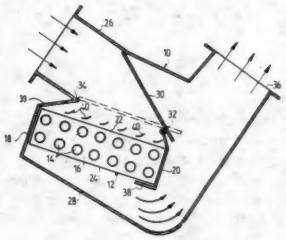
Patrick Cadars, Montigny, and Daniel LeFevre, Elancourt, both of France, assignors to Valeo, Paris, France

Filed Apr. 12, 1984, Ser. No. 599,686

Claims priority, application France, May 11, 1983, 83 07917

Int. Cl.[4] F28F *13/12*

U.S. Cl. 165—122 13 Claims



1. In a heat exchanger unit for an air conditioner, in particular for the cabin of a motor vehicle, comprising:

(a) a casing having an inlet duct and an outlet duct, each communicating with the interior of said casing and defining an air path therethrough;

(b) a heat exchanger housing mounted in said casing for receiving a heat exchanger core; and

(c) a heat exchanger core mounted in said housing across the air path, said heat exchanger core presenting two oppositely disposed large faces,

(1) an upstream face to which the said inlet duct leads, said upstream face being disposed at an angle generally oblique to said inlet duct, and

(2) a downstream face to which said outlet duct leads,

whereby air passing from said inlet duct, through said heat exchanger core to said outlet duct, passes through different portions of said heat exchanger core at different speeds, said speeds ranging from a maximum speed through a first portion of said core to a minimum speed through another portion of said core;

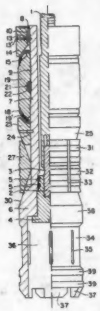
the improvement comprising a baffle wall means positioned closely adjacent said downstream face at said first portion of said core, said baffle wall means having a width which is about 10% to 20% of the corresponding dimension of said downstream face, a portion of the upstream face disposed oppositely to the baffled portion of said downstream face being substantially unbaffled closely adjacent said upstream face;

whereby a loss of head is created in the region of said core adjacent said baffle, with air flow through said core becoming more uniform, overall head loss through said core being decreased, and the heat exchanging ability of said core and total quantity of air passing through said core being increased.

4,595,052
REPERFORABLE BRIDGE PLUG

Juan C. Kristiansen, Chubut, Argentina, assignor to Metalurgica Industrial Mecanica S.A., Buenos Aires, Argentina

Filed Mar. 13, 1984, Ser. No. 589,029
Claims priority, application Argentina, Mar. 15, 1983, 292396
Int. Cl.[4] E21B *33/129*
U.S. Cl. 166—123 19 Claims



1. In a reperforable bridge plug of the type having means for fastening to a tool through a weak point and integrated by an elastic gasket between support and compression pieces, and dentated fastening means for fastening to a tube line, the improvement comprising:

a bridge plug having a tubular body with upper and lower ends;

an enlarged diameter hollow portion on the lower end portion of said bridge plug forming a chamber having a tubular wall in said lower end;

a plurality of slots through said wall so that said chamber communicates with the exterior of said bridge plug body;

a plurality of calibrated rings formed by enlargements of the exterior surface of said wall calibrated to fit the well diameter in which the bridge plug is to be applied;

an interchangeable converter plug mounted in the end of said tubular body adjacent said enlarged portion thereof between said chamber and the tubular body;

a lower compression piece located below the elastic gasket and fastened to said tubular body by a fuse pin and having an external frusto conical surface thereon;

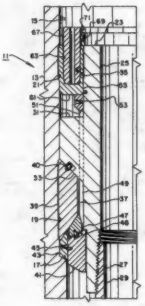
a frusto conical surface on the exterior of said enlarged diameter portion spaced below said lower compression piece; and

the dentated fastening means comprises a one piece cylindrical jaw member mounted on said tubular body between said lower compression piece and said enlarged diameter portion, two oppositely directed diverging frusto conical surfaces on the interior surface of said jaw member at least partially operatively engaging respectively in superposition said frusto conical surfaces on said lower compression piece and enlarged diameter portion, substantially circumferential saw teeth on the exterior surface of said jaw member arranged so that the points on said teeth on opposite sides of a substantial middle position on the exterior surface of said jaw member are oppositely directed, and a plurality of circumferentially spaced axially directed slots in the exterior surface of said jaw member to produce weak fracture areas in said jaw member which fracture in response to predetermined relative movement toward each other of said lower compression piece and said enlarged diameter portion of said bridge plug.

4,595,053
METAL-TO-METAL SEAL CASING HANGER

Bruce J. Watkins, Rancho Palos Verdes, and Marcelo P. Rosero, Buena Park, both of Calif., assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 20, 1984, Ser. No. 622,603
Int. Cl.[4] E21B *33/04, 40/00*
U.S. Cl. 166—209 6 Claims



1. For use in a wellhead member having a bore, an improved hanger adapted to be mounted in the bore for supporting a string of conduit, comprising in combination:

a hanger body having a lower end to which the conduit is adapted to be secured;

a plurality of parallel wickers formed on the exterior of the body for alignment with a plurality of parallel wickers formed in the bore;

locking means positionable in an annular clearance provided between the body and the bore for locking the body in the bore;

a deformable metal seal ring positionable in the clearance between the wickers of the bore and wickers of the body, having inner and outer sidewalls; and

wedge means for urging the sidewalls radially apart to embed within the wickers of the body and the bore.

4,595,054
WELL LOCK HAVING RETRACTABLE NO-GO DOGS

Alan G. Schroeder, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed May 20, 1985, Ser. No. 736,031
Int. Cl.[4] E21B *23/02*
U.S. Cl. 166—217 9 Claims

1. A well lock adapted to lock in a landing nipple in a well in which the nipple includes a locking notch and a landing shoulder comprising,

a body having seal means thereon for sealing in the nipple,

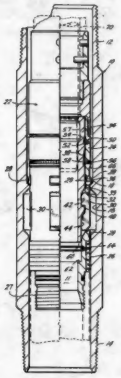
at least one retractable no-go dog radially movable in the body and adapted to engage the landing shoulder when extended outwardly,

at least one locking dog radially movable in the body and adapted to lock in the locking notch when extended outwardly,

an expander tube telescopically movable in the body between a running position and a set position, said expander tube including a no-go dog locking shoulder for holding the no-go dogs outwardly when the tube is in the running position and including a no-go dog recess for allowing the no-go dogs to retract when the expander tube is in the set position,

said expander tube including a locking dog shoulder for holding the locking dogs outwardly when the expander is in the set position, and including a locking dog recess for

allowing the locking dogs to retract when the expander tube is in the running position,



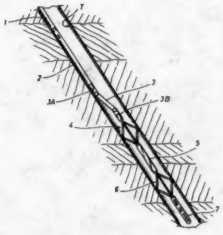
releasable locking means between the body and the expander tube for releasably locking the tube in the running and set positions.

4,595,055

CENTERING APPARATUS

Daniel Vannier, St Cyr l'Ecole, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed May 8, 1984, Ser. No. 608,057
Claims priority, application France, May 10, 1983, 8307831
Int. Cl.[4] E21B *17/10*
U.S. Cl. 166—241 **14 Claims**



1. a device for centering a tool forming a part of a tool string, inside a cased well comprising:

a central bar suitable for being integrated in a tool string for lowering the tool inside the tubing;

two slides which are slidable over a limited range of said central bar;

a series of wheel-carrying structures of generally triangular geometry defined by arms which are hinged to said slides;

a series of wheels, each wheel being mounted to one of said wheel-carrying structures in a plane which is inclined relative to the radial plane defined by said one of said wheel-carrying structures to rotate freely on said one of said wheel-carrying structures in said inclined plane in such a manner that the periphery of said wheel projects radially outwardly; and

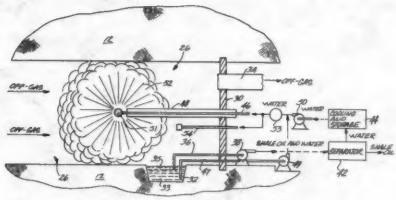
resilient return means urging the wheel-carrying structures radially outwardly.

4,595,056

METHOD FOR FULLY RETORTING AN IN SITU OIL SHALE RETORT

Raymond L. Zahradnik; Carl L. Jacobson, both of Grand Junction, Colo., and Jian-Chyun Shen, Houston, Tex., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Mar. 26, 1984, Ser. No. 593,438
Int. Cl.[4] E21B *43/243, 47/06*
U.S. Cl. 166—251 **42 Claims**



1. A method for operating an in situ oil shale retort in a subterranean formation containing oil shale, the retort containing a fragmented permeable mass of formation particles containing oil shale within top, bottom and side boundaries of unfragmented formation and havig a drift in communication with a lower region of the fragmented mass for withdrawal of liquid products of retorting and an off-gas comprising gaseous products of retorting, the method comprising the steps of:

introducing a retort inlet mixture into an upper region of the fragmented mass in the retort for advancing a retorting zone downwardly through the retort for producing liquid and gaseous products of retorting;

withdrawing retort off-gas comprising gaseous products of retorting through the product withdrawal drift;

monitoring the temperature of the off-gas in the product withdrawal drift; and

when the temperature of the off-gas exceeds a first selected temperature, spraying a sufficient amount of water into the off-gas stream in the withdrawal drift for contacting formation surrounding the drift with cooling water and for maintaining the temperature of the off-gas at no more than a second selected temperature.

4,595,057

PARALLEL STRING METHOD FOR MULTIPLE STRING, THERMAL FLUID INJECTION

John R. Deming, Moraga; Suzanne Griston, San Dimas, and Ki C. Hong, Orange, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 18, 1984, Ser. No. 611,794
Int. Cl.[4] E21B *36/00, 43/24*
U.S. Cl. 166—269 **6 Claims**

1. A method for multiple string, thermal fluid injection within a well which penetrates at least two strata which are separated by at least one relatively impermeable strata comprising the steps of

packing off the well to establish a first zone at the first stratum and a second zone at the second stratum;

introducing a first tubing string into the well;

terminating the first tubing string at the first zone;

paralleling the first tubing with a second tubing string;

ending the second tubing string at the second zone;

physically separating the first and second tubing strings;

injecting a first fluid at a first temperature into the first tubing string while simultaneously injecting a second fluid at a second temperature into the second tubing string;

insulating the first tubing string through the second zone to minimize heat transfer between the second fluid from the second tubing string and the first fluid in the first tubing string; and

applying the first fluid at a first temperature to the first zone

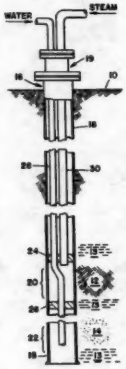
while simultaneously applying the second fluid at a second temperature to the second zone.

6. Apparatus for injecting at least one thermal fluid down a single injection well comprising:

an injection well penetrating at least an upper and a lower producing formation;

casing within the injection well having perforations providing communication to the upper producing formation and to the lower producing formation from within the casing;

first packer means for establishing a first zone within the injection well adjacent the perforations in the casing to provide communication with the lower producing formation;



second packer means above the first packer means and cooperating therewith to establish a second zone adjacent the perforations in the casing to provide communication with the upper producing formation;

a first tubing string extending from the earth's surface through the first packer means and the second packer means and ending in the first zone;

a second tubing string extending from the earth's surface through the second packer means and ending in the second zone; and

insulation means on the first tubing string below the second packer means and continuing through at least the second zone for minimizing heat transfer between fluid in the first tubing string with fluid injected from the second tubing string in the second zone.

4,595,058

TURBULENCE CEMENTING SUB

Joe F. Nations, Slidell, La., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 28, 1984, Ser. No. 645,141

Int. Cl.[4] E21B *33/14, 17/00*

U.S. Cl. 166—285 **16 Claims**

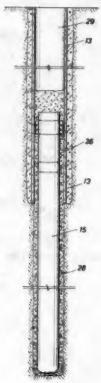
1. A turbulence-generating cementing sub adapted to be connected into a well casing and pass downwardly into a portion of a a second well casing and be positioned therein, said sub comprising:

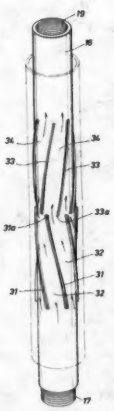
a short tubular body member,

casing thread means at each end of said body member for connecting said body member in end-to-end axial alignment between two sections of a well casing,

a plurality of first rigid flow-directing means formed on the outer surface of said tubular body member and extending outwardly therefrom and fixedly and integrally arranged on said body member in spaced-apart parallel relationship in a direction to cause a cement slurry flowing thereby to swirl around said body member in one direction toward one end of said body member and at an angle to one side of the axis thereof, and

a plurality of second rigid flow-directing means formed on the outer surface of said tubular body member in spaced-apart relationship and extending outwardly therefrom adjacent to and axially displaced from said first flow-directing means and fixedly and integrally arranged on said body member in a second direction at an angle to the





other side of the axis thereof to cause cement slurry flowing thereby to swirl around said body member is said second direction toward the same end of said body member to cause a zone of turbulence in said flowing cement slurry, said flow directing means extending outwardly from the body member an overall distance less than the inner diameter of the well casing into which it is passed and positioned.

4,595,059

METHOD OF PROVIDING A CONDUCTOR PIPE TO AN OPENING PORTION OF A WELL

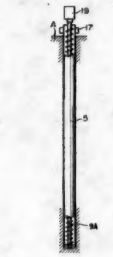
Kunio Katagiri, Funabashi; Joji Arimura, Yokosuka; Kazuo Kondo, Chigasaki, and Taisuke Fujise, Tokyo, all of Japan, assignors to Japan Metals & Chemicals Co., Ltd. and Shimizu Construction Co., Ltd., both of, Japan

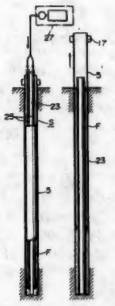
Filed Oct. 15, 1984, Ser. No. 661,152

Claims priority, application Japan, Oct. 18, 1983, 58-194765

Int. Cl.[4] E21B *7/20, 33/14*

U.S. Cl. 166—290 5 Claims





1. A method of providing a conductor pipe to an opening portion of a well, comprising:

(a) drilling the ground with a casing tube and an auger screw, inserted into the casing tube, to form a bore to a predetermined depth;

(b) then, withdrawing the auger screw from the casing tube;

(c) thereafter, inserting the conductor pipe into the casing tube placed in the bore and concentrically positioning the conductor pipe in the casing tube to form an annular space therebetween;

(d) supplying a solidifiable filler to the annular space from the bottom portion of the space to the upper portion thereof;

(e) after the step d, withdrawing the casing tube from the bore; and

(f) after the step e, solidifying the filler to thereby fix the conductor pipe to the opening portion of the well.

4,595,060

DOWNHOLE TOOL WITH COMPRESSIBLE WELL FLUID CHAMBER

Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 28, 1984, Ser. No. 676,022

Int. Cl.[4] E21B *34/06*

U.S. Cl. 166—373 11 Claims

1. A downhole tool apparatus, comprising:

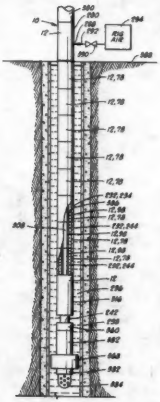
a housing, having a compression chamber defined therein, and having a fill passage means disposed through said housing for placing said compression chamber in open flow fluid communication with a well annulus exterior of said housing so that well fluid may flow into said compression chamber as said apparatus is lowered into a well;

an isolation valve means for selectively closing said fill passage means and for thereby trapping said well fluid in said compression chamber;

an operating element disposed in said housing;

an actuating piston means slidably disposed in said housing, said actuating piston means being operably associated with said operating element so that said operating element is operated in response to movement of said actuating piston means relative to said housing;

a bypass passage means disposed through said housing for communicating a flow passage of said housing with said well annulus exterior of said housing;



a bypass valve means for selectively closing said bypass passage means;

wherein said actuating piston means and said housing are so arranged and constructed that movement of said actuating piston means between first and second positions thereof relative to said housing decreases a volume of said compression chamber and of any well fluid trapped therein; and

wherein said volume of said compression chamber is sufficiently large that an equal volume of water containing no absorbed gases would have a volume decrease when subjected to a pressure increase equivalent to a predetermined operating pressure of said actuating piston means, at least as great as the decrease in volume of said compression chamber when said actuating piston means is moved between its first and second positions relative to said housing.

4,595,061

DEEP WELL PIPE WATER RELEASE VALVE

Thomas L. Underwood, 10 Villa Pkwy., Highland Falls, N.Y. 10928

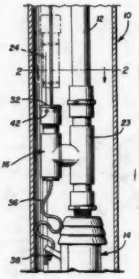
Filed Aug. 14, 1984, Ser. No. 641,308

Int. Cl.[4] E21B *34/06;* F04B *39/14*

U.S. Cl. 166—373 12 Claims

1. A deep well pipe water release valve including a valve assembly comprising a body defining an upright passage therethrough having upper and lower ends, said body including a lateral port having an inner end opening into said passage intermediate said upper and lower ends ans an outer end adapted for sealed communication with the interior of the lower end portion of a deep well delivery pipe disposed in a

deep well, a valve member slidably received in said passage and upwardly displaceable from the latter, said valve member being shiftable in said passage to a position spanning across said port, seal means establishing a sliding fluidtight seal between said valve member and said body both above and below said port, and vertical pull means including a lower end terminal portion adapted for anchored securement to a motor and pump assembly within said deep well below said body and an intermediate height lower end portion above said lower terminal end portion operably connected to said valve member for upward displacement of the latter from the upper end of said passage upon an upward pull on the upper end portion of said pull member and with the operable connection of said pull member with said valve member being sufficiently spaced above said lower terminal end of said pull member to enable upward displacement of said valve member from the upper end of said passage before a continued upward pull on said pull member is effective to apply an upward pull on said motor and pump assembly.



12. The method of adapting a deep well pumping system for ease in upward retrieval of the pumping system from an associated well wherein the pumping system includes a deep well motor and pump assembly and a delivery pipe extending upwardly from said assembly at least substantially to ground level, said method comprising establishing a vertical passage closely adjacent the lower end portion of said delivery pipe above said assembly with an intermediate length portion of said passage in communication with the interior of said delivery pipe, providing a valve member slidably received within said passage, upwardly displaceable from the upper end of said passage and including spaced seal means establishing sliding fluid tight seals between said valve member and said passage above and below said intermediate length portion of said passage, providing an elongated flexible pull member having a lower end anchored relative to said assembly and a second lower portion thereof spaced above said lower end including a connection with said valve member such that an upward pull on the upper end of said pull member will first upwardly displace said valve member from said passage and thereafter upwardly displace said assembly and delivery pipe.

4,595,062

WELL CASING JACK MECHANISM

George I. Boyadjieff, Anaheim, and Andrew B. Campbell, San Marino, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Filed Jul. 17, 1980, Ser. No. 169,718

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.[4] E21B *7/20*

U.S. Cl. 166—379 **11 Claims**

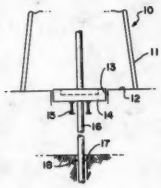
1. The method that comprises:

drilling a well utilizing a rig which includes a mast projecting upwardly above the well in a predetermined drilling position, and utilizing a drill string extending along a predetermined axis relative to said mast and downwardly into the well;

removing said drill string from the rig after completion of the drilling operation;

then lowering along said axis and into the well, while said mast remains in said drilling position above the well, a string of casing which, during at least a portion of the casing lowering operation, has a weight greater than the load supporting capacity of said mast used in drilling;

effecting the downward movement of said casing string,



during at least said portion of the casing lowering operation when the weight of the string exceeds the capacity of the mast, by relatively vertically actuating two casing supporting units of a jacking mechanism positioned in the rig, with the casing string being supported alternately by the two units respectively; and

transmitting downward load forces resulting from the weight of said casing string from each of said supporting units to the earth without transmission of said forces through said mast, but while said mast used in drilling remains in said drilling position above the well.

4,595,063

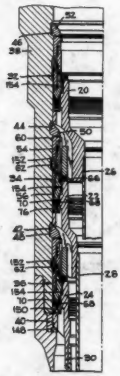
SUBSEA CASING HANGER SUSPENSION SYSTEM

Charles E. Jennings, and Bob C. Hopkins, both of Houston, Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 26, 1983, Ser. No. 535,470

Int. Cl.[4] E21B *43/01;* **F16L** *35/00*

U.S. Cl. 166—382 **15 Claims**



10. A well packoff assembly for packing off an annulus between a wellhead housing and a lower casing hanger, comprising an annular body and annular packing means on said body for establishing a pressure seal between said wellhead housing and said lower casing hanger, and radially expandable and retractable casing load support means retained on said body and cooperable with said wellhead housing to suspend an upper casing hanger directly from, and transfer the entire hang

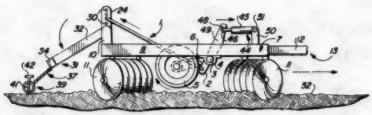
load of said upper casing hanger directly to, said wellhead housing.

4,595,064

DRAG ATTACHMENT FOR A DISK

Ronald D. Anderson, Rte. 1, Box 37A, Homer, La. 71040

Filed Jul. 30, 1984, Ser. No. 635,448
Int. Cl.[4] A01B *35/18, 49/02*
U.S. Cl. 172—178 **21 Claims**



1. In a cultivating device having a frame, a shaft pivotally mounted in the frame, transport wheels carried by the shaft and a fluid-operated cylinder in cooperation with the shaft for raising and lowering the transport wheels, the improvement in combination therewith comprising:

(a) at least one drive arm extending from the shaft in fixed relationship;

(b) a pivot arm rotatably cooperating with the cultivating device in spaced, substantially parallel relationship with respect to the shaft;

(c) at least one connecting rod having one end pivotally carried by said pivot arm, said connecting rod extending toward said drive arm and the opposite end of said connecting rod in close proximity to said drive arm;

(d) linking means joining said drive arm to said opposite end of said connecting rod; and

(e) support means fixedly carried by said pivot arm, whereby operation of the fluid-operated cylinder in a first selected mode raises the transport wheels and lowers said support means and operation of the fluid-operated cylinder in a second selected mode lowers the transport wheels and raises said support means; and

(f) a drag pipe carried by said support means and a pair of auxiliary drag pipes provided in each end of said drag pipe in telescoping relationship, respectively.

4,595,065

SHAFT DRILLING RIG

Masami Wada, Chiyodamura, and Shuichi Ajiro, Tsuchiura, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

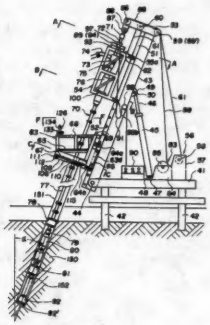
PCT No. PCT/JP83/00156, § 371 Date Dec. 14, 1983, § 102(e) Date Dec. 14, 1983, PCT Pub. No. WO84/04778, PCT Pub. Date Dec. 6, 1984
PCT Filed May 23, 1983, Ser. No. 567,847
Int. Cl.[4] E21B *19/20*
U.S. Cl. 175—85 **15 Claims**

1. A shaft drilling rig comprising:

a supporting structure for a drill string having a plurality of components for drilling a shaft into the earth by imparting a turning and thrust for drilling at least to a drill bit on the drill string, the drilling being down to a predetermined depth, and then a further drill string component having at least at the bottom end thereof an inner wall extending substantially in the axial direction of the component being newly added to the drill string for further drilling;

means for receiving at least the bottom end of the further drill string component and for supporting it, and having a member with the outer circumference engageable with the inner wall of the further component, said receiving means supporting the further drill string component in a free standing position;

means for supporting said receiving means and having a guiding device for guiding said receiving means between a position where the further drill string component is to be added to the drill string and a parking position spaced laterally of the drill string from said first mentioned position; and



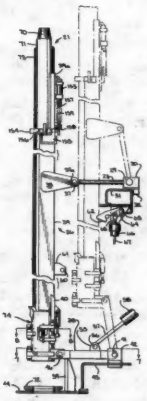
means for holding a lower part of the drill string which has been separated from the upper part of the drill string preparatory to adding the further drill string component so that the axis of said lower part is substantially aligned with the drilling direction.

4,595,066

APPARATUS FOR HANDLING DRILL PIPES

Jack D. Nelmark, New Berlin, and James A. Stanke, Greenfield, both of Wis., assignors to Becor Western, Inc., So. Milwaukee, Wis.

Continuation of Ser. No. 562,210, Dec. 16, 1983, abandoned. This application Jul. 8, 1985, Ser. No. 752,663
Int. Cl.[4] E21B *19/14*
U.S. Cl. 175—85 **8 Claims**



1. A drill pipe handling mechanism of a type usable in a pipe rack on a mobile earth drilling unit and cooperable with a drill head, the mechanism comprising:

an elongated channel member mounted longitudinally in the rack to move between a retracted, storage position and an extended position where a pipe is connected to, and disconnected from, the drill head, the channel member having a trough in which a backside of the drill pipe is supported;

a closure at a lower end of the channel member, the closure including a pair of doors and the closure supporting a

lower end of the pipe when the doors are closed, the doors having respective back portions pivotally mounted at the lower end of the channel member and having front portions that may be opened apart or closed together by pivoting the doors, the doors having respective lugs extending laterally along outer sides of their front portions wherein lugs on one door are interposed between adjacent lugs on the other door when the doors are closed, the doors carrying pawl means inside to oppose rotation of a lower end of the pipe in one direction;

securing means mounted on one of the doors for movement into and out of a position coupling the interposed lugs with the adjacent lugs and securing the doors against opening when the drill head is loosened from the pipe by rotation in the direction in which the pawl means opposes rotation of the pipe;

a first fluid-driven actuator carried by one of the doors and coupled for actuating the movement of the securing means into and out of its position coupling the interposed and adjacent lugs; and

a second fluid-driven actuator mounted along a backside of the channel member and coupled to pivot the doors to open and close when the securing means is out of its position coupling the interposed and adjacent lugs.

8. A locking mechanism for securing first and second laterally swinging, longitudinally extending doors that pivot to open and close a receptacle at a lower end of a drill pipe carrier, the mechanism comprising:

upper and lower pairs of the lugs extending laterally along the outside of the first door, the upper and lower pairs being spaced longitudinally on the first door, and within each pair, the lugs being longitudinally spaced from each other;

upper and lower lugs extending laterally along the outside of the second door, the upper lug extending between the upper pair of lugs on the first door when the doors are closed, and the lower lug extending between the lower pair of lugs on the first door when the doors are closed, the lugs on the first door and the second door having apertures which become aligned when the doors are closed;

an upper cross member extending laterally above the upper pair of lugs on the first door, and a lower cross member extending laterally above the lower pair of lugs on the first door, each cross member carrying a respective pin that is received in the apertures of the lugs immediately below it when the doors are closed;

a shaft mounted for longitudinal movement on the first door, the shaft being connected to the cross members for moving the pins into and out of a position where the pins are received in the apertures of the respective lugs to secure the doors; and

a fluid-driven actuator carried on the first door and coupled to the shaft to move the shaft longitudinally in response to actuation from an external source of pressurized fluid.

4,595,067

ROTARY DRILL BIT, PARTS THEREFOR, AND METHOD OF MANUFACTURING THEREOF

Eric F. Drake, Pearland, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Jan. 17, 1984, Ser. No. 571,410

Int. Cl.[4] E21B *10/46, 10/50, 10/52*

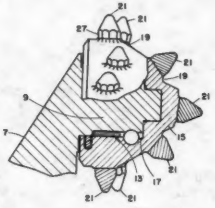
U.S. Cl. 175—331 **10 Claims**

1. In a roller cutter for a rotary drill bit having a generally conical roller cutter body formed of metal;

a plurality of improved separate individual cutting elements secured to the outer surface of the roller cutter body primarily by welding and being substantially free of mechanical interconnection to the roller cutter body, each cutting element being an elongate member having a base portion at one end thereof engageable with the roller cutter body and a tip portion at its other end engageable with the formation to be drilled;

each improved cutting element comprising a metallurgical composite of at least two varying phases with the composite having a substantially continuous mechanical gradient through at least said tip portion, at least one of said phases being a refractory compound and at least another of the phases being a binder metal or alloy;

said tip portion having a greater volume of said one phase



than said another phase to provide a relatively high compressive strength but having a coefficient of thermal expansion and elastic moduli significantly different from that of the metal of the roller cutter body to render it incapable of being satisfactorily welded to the roller cutter body;

said base portion having a greater volume of said another phase than said one phase to provide a coefficient of thermal expansion and elastic moduli similar to those of the metal of the roller cutter body thereby permitting it to be easily welded to the roller cutter body.

4,595,068

TRANSMISSION APPARATUS

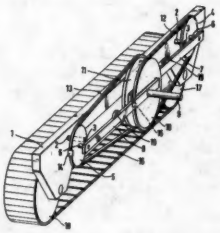
Fritz Seeber, 6731 Elmstein-Helmbach, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,037

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1982, 3231477

Int. Cl.[4] B62D *55/116*

U.S. Cl. 180—9.52 **8 Claims**



1. Transmission apparatus for converting rotational motion into linear motion comprising a control disk having a circumferental periphery defining at least a circular arc section with said circular arc section having a center point, an eccentric disk spaced from said control disk and having a circular circumferential periphery, said eccentric disk having a center point and an eccentric point spaced from said center point, said eccentric disk having a neutral position relative to said control disk, drive means for interconnecting the circumferential periphery of said control disk and the circumferential periphery of said eccentric disk for transferring motion therebetween, said drive means being in engagement with the circumferential periphery of said control disk and said eccentric disk and having a disengaging point with each of said control disk and eccentric disk, a rocker arm having a first end and a second

end, said rocker arm extending between said control disk and said eccentric disk with the center point of said eccentric disk rotatably mounted on the second end of said rocker arm, the first end of said rocker arm is pivotally mounted about a pivot axis on said control disk with the pivot axis located on a straight line connecting the center point of said circular arc section of said control disk and the disengaging point of said drive means with the circumferential periphery of said control disk in the neutral position of said eccentric disk, a first and a second conrol disk in side-by-side relation on a common axis, a first and a second said eccentric disk with said eccentric disks located laterally outwardly on opposite sides from the common axis of said control disks, a first and a second rocker arm with said first rocker arm secured to said first control disk and to said first eccentric disk and said second rocker arm secured to said second control disk and to said eccentric disk, said transmission apparatus is arranged to be mounted on an off-the-road vehicle including a rigid carrier extending in the long direction of said rocker arms, said carrier arranged to act as track or wheel carrier, a connecting pin located adjacent each of the opposite ends of said carrier, said eccentric point of each said eccentric disk being located on one of said connecting arm having a pin extending therefrom at the end spaced from said control disks, each said eccentric disk rotatably mounted on a different one of said pins, a central pin located intermediate the ends of said carrier and rotatably supporting said control disks, said rocker arms are pivotally mounted on said central pin, hydraulic cylinders arranged to be secured to the chassis of the vehicle, said hydraulic cylinders including piston rods engaged with a different one of said rocker arms, and said drive means connecting said first control disk to said second eccentric disc and said second control disk to said first eccentric disk.

4,595,069

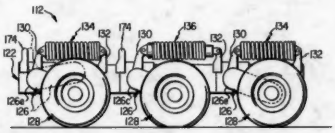
ALL TERRAIN/HIGH SPEED UNDERCARRIAGE

Norman D. Oswald, Duncanville; Carl M. Franklin, Midlothian; Marc H. Gutzler, Duncanville, and Harry S. Mankey, Dallas, all of Tex., assignors to Standard Manufacturing Company, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 426,218, Sep. 28, 1982, Pat. No. 4,454,925. This application Jun. 21, 1983, Ser. No. 506,403

Int. Cl.[4] B62D *61/10*

U.S. Cl. 180—24.02 **20 Claims**



1. An undercarriage comprising:

an elongate hollow load bearing primary frame;

at least three secondary frames;

means supporting the secondary frames at longitudinally spaced points on the primary frame for pivotal movement with respect thereto;

at least three primary axles each having a first portion positioned within the primary frame and a second portion positioned within one of the secondary frames;

means supporting each of the primary axles for rotation both with respect to the primary frame and with respect to its associated secondary frame;

primary transmission means positioned within the primary frame for drivingly interconnecting at least two of the primary axles;

drive means operably connected to the primary transmission means for actuation thereof whereby the drive means and the primary transmission means effect concurrent rotation of the interconnected primary axles;

a plurality of secondary axles each individual to one of the secondary frames and each having a wheel receiving member at one end thereof;

at least three wheel members each mounted on and secured to the wheel receiving end of one of the secondary axles;

means rotatably supporting the secondary axles in the secondary frames with each of the secondary axles extending out of its secondary frame and being rotatably supported in at least one side of its secondary frame;

at least two secondary transmission means each mounted in one of the secondary frames and each drivingly interconnecting one of the primary axles and its associated secondary axle;

one or more first arms mounted on and extending from one or more of the secondary frames adjacent the pivotal axis thereof;

one or more second arms corresponding to each of the first arms mounted on and extending from the primary frame at a predetermined distance from the corresponding first arm;

one or more spring/shock absorber assemblies each mounted substantially horizontally between corresponding first and second arms for controlling and limiting pivotal movement of the secondary frames relative to the primary frame, such that the spring/shock absorber assemblies are placed in tension as the associated wheel members are displaced toward the primary frame; and

at least one of the spring/shock absorber assemblies mounted on the center-most secondary frame including a cylinder assembly allowing variation of the overall length of the spring/shock absorber assembly for controlling and limiting pivotal movement of the secondary frame relative to the primary frame, for normally positioning the wheel member on the secondary frame relative to the wheel members mounted on the other secondary frames to facilitate skid steering, and for selectively positioning the wheel member mounted on the secondary frame to facilitate high speed operation.

4,595,070

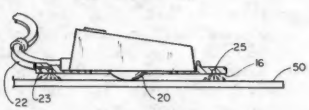
CURSOR CONTROL SUPPORT DEVICE

Richard P. Hodges, 771 Kiowa Rd., Pinewood Springs, Lyons, Colo. 80540

Filed Jun. 27, 1984, Ser. No. 625,024

Int. Cl.[4] B60V *1/00*

U.S. Cl. 180—125 **6 Claims**



1. An air cushion support device for computer cursor control consisting of:

computer cursor support means for use on a flat smooth surface;

air supply means communicating with the said cursor support means capable of supplying a sufficient flow of air to support said support means on a cushion of air; and

air distribution means located on said support means communicating with said supply means and the surface on which the computer cursor support means rests, said means being capable of distributing the air supplied by said air supply means in a manner so as to provide a uniform fluid cushion between said cursor support means and said surface.

4,595,071

HYDRAULIC POWER-ASSISTED STEERING GEAR FOR VEHICLES

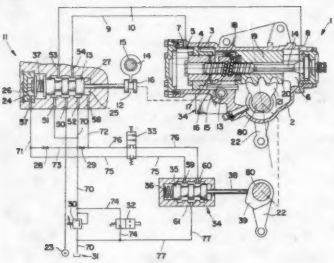
Herbert Mehren, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 19, 1985, Ser. No. 724,904

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414843

Int. Cl.[4] B62D *5/10*

U.S. Cl. 180—132 **14 Claims**



1. A hydraulic power-assisted steering gear for use with a vehicle having steerable wheels, the steering gear comprising

means for turning the steerable wheels between a straight position and at least one deflected position,

manual steering means for operating the turning means in response to an instruction from a vehicle operator,

power-assisted steering means for assisting the manual steering means in operation of the turning means, the power-assisted steering means including hydraulic means for operating the turning means using a flow of pressurized working medium, a valve housing in fluid communication with the hydraulic means, and a control valve spool slidably received in the valve housing and movable therein between a straight wheel position, a first steering direction position, and an opposite second steering direction position, the turning means being operated by the manual steering means with assistance from the power-assisted steering means when the control valve spool is in one of the first and second steering direction positions, and

return means for returning automatically the steerable wheels from a deflected position to the straight position, the return means including means for sensing a selected deflected position of the steerable wheels which corresponds to one of the first and second steering direction positions of the control valve spool, and means for continuously urging the control valve spool toward the other of the first and second steering direction positions when the steerable wheels are turned to a deflected position due to operation of the turning means so that the steerable wheels are returned to the straight position and the vehicle operator senses a magnified or diminished manual force indicative of a tendency of the turning wheels to return to straight position via the manual steering means.

4,595,072

VEHICLE SUSPENSION SYSTEM

Daniel Barnea, 930 Commonwealth Ave., Boston, Mass. 02215

Filed Oct. 27, 1983, Ser. No. 546,176

Int. Cl.[4] B62D *55/14*

U.S. Cl. 180—169 **11 Claims**

1. A vehicle comprising:

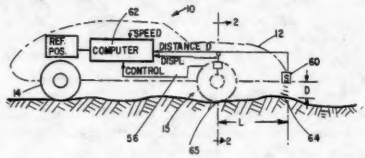
(a) a chassis member;

(b) a ground engaging member mounted on said chassis member for supporting the same as the vehicle traverses a road surface;

(c) a load supporting member such as a seat;

(d) mounting means for mounting the load supporting member on the chassis member;

(e) operable means interposed between two of the members for controlling the point in time, the magnitude, and the rate of deflection therebetween; and



(f) anticipating means for monitoring the condition of the road surface in advance of the point at which the ground engaging member engages the road surface;

(g) said operable means being responsive to said anticipating means for stabilizing said load supporting member.

4,595,073

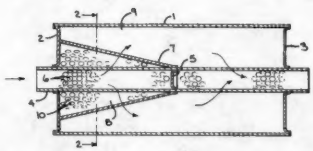
PLUG-TYPE MUFFLER SECTION

Prakash T. Thawani, Stoughton, Wis., assignor to Nelson Industries Inc., Stoughton, Wis.

Filed May 14, 1984, Ser. No. 610,129

Int. Cl.[4] F01N *1/08*

U.S. Cl. 181—265 **9 Claims**



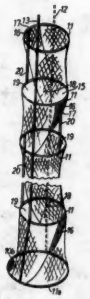
1. A plug section for a muffler having improved sound attenuation characteristics, comprising an outer body, an inlet pipe to introduce exhaust gas to the body and having an inner end portion disposed within the body, a closure to close off the inner end portion of said pipe, said pipe having a plurality of perforations extending substantially the entire length of said end portion, a generally conical member disposed within the body and surrounding said pipe and having a small diameter end and a large diameter end, said conical member having a plurality of second perforations extending substantially the entire length of said conical member, said conical member being spaced outwardly from said pipe to define an inner chamber therebetween and being spaced from the body to provide an outer chamber, said inner chamber being empty and constituting a sound attenuating chamber, and closure means for closing off the ends of said conical member, exhaust gas entering the section through said pipe flowing transversely outward through said first perforations into said inner chamber and then flowing transversely outward through said second perforations to said outer chamber and subsequently being discharged from said section.

4,595,074

STOCKING-LIKE ESCAPE DEVICE

Svein Nordtvedt, Godvik, Norway, assignor to Bergen Patentkontor, Bergen, Norway

PCT No. PCT/NO82/00061, § 371 Date Aug. 1, 1984, § 102(e) Date Aug. 1, 1984, PCT Pub. No. WO84/02658, PCT Pub. Date Jul. 19, 1984
PCT Filed Dec. 30, 1982, Ser. No. 638,470
Int. Cl.[4] A62B *1/20*
U.S. Cl. 182—48 6 Claims



4. An escape device comprising

a stocking to be suspended in a downward manner;

a plurality of annular reinforcing elements arranged at spaced apart intervals along the length of said stocking;

at least one pair of diametrically opposed lines secured to said reinforcing elements for suspending said stocking, and

a plurality of pieces defining a zig-zag shaped passage through said stocking, each said piece being connected to and extending obliquely downwards and inwards into said stocking from an upper reinforcing element to a transverse center line of a lower reinforcing element and defining an access opening to the interior of said stocking.

4,595,075

COLLAPSIBLE LADDER ASSEMBLY

Denis Rodrigue, 509 Murray, Greenfield Park, Quebec, Canada (J4V 1N8)

Filed Aug. 26, 1985, Ser. No. 769,475
Int. Cl.[4] E06C *1/56, 9/14*
U.S. Cl. 182—70 11 Claims

1. A collapsible ladder assembly comprising:

a ladder storage container having, in closed condition, a fixed upright rear wall, an upright front wall facing said rear wall, a horizontal bottom wall joining said front and rear walls at a lower end of said front and rear walls and a horizontal top wall joining said front and rear walls at a top end of said front and rear walls, said top wall comprising a rearward section solid with said rear wall and projecting toward said front wall and a frontward section joined to said front wall and projecting from said front wall toward said rear wall;

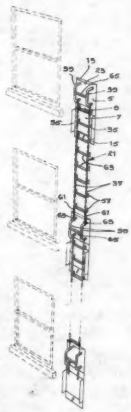
means releasably locking said top wall sections together;

a plurality of means respectively hingedly joining said top wall frontward section and said front wall along adjoining edges thereof, said front wall and said bottom wall along adjoining edges thereof and said bottom wall and said rear wall along adjoining edges thereof, for respective pivotal movement of said joined forward section and said walls about horizontal and parallel axes whereby, in released condition of said top wall sections, said frontward section of said top wall, said front wall and said bottom wall unfold downwardly away from said fixed rear wall by pivoting about said horizontal and parallel axes so as to hang from said lower end of said rear wall;

a collapsible ladder housed, in collapsed condition, within said container when said releasable locking means lock said top wall sections together in said closed condition of said container, and

means securing a top end of said collapsible ladder to said container rear wall,

wherein said frontward section of said top wall is formed with a through aperture and overlies said rearward section in closed condition of said container, and



wherein said means releasably locking said sections together comprise: a lug downwardly projecting from the free edge of said rearward section; an upwardly biassed locking strip secured at one end to and beneath said frontward section and upwardly turned at the other end in engagement with said lug and behind said lug with respect to said one end; and a release piston fixed to said locking strip and having one end slidable through said aperture to project above said frontward section, constructed so that downward pushing on said piston from outside of said container disengages said upturned end of said locking strip from said lug and causes opening of the container.

4,595,076

TREE CLIMBING APPARATUS

Benjamin G. Gober, 275 Clifton Dr., Athens, Ga. 30603

Filed Sep. 4, 1985, Ser. No. 772,532
Int. Cl.[4] A45F *3/26;* A47C *9/10;* A63B *27/00*
U.S. Cl. 182—136 5 Claims

1. Climbing apparatus comprising a plate member having one end of a strap secured thereto by a first attachment, a second attachment on the plate member for retaining a free end portion of the strap in adjusted position along the strap with the strap encircling a tree, pole, or the like, and a hand lever on the plate member for twisting the plate member in a manner

tightening the strap around the tree, pole, or the like, by decreasing the horizontal distance between the attachments, the

lever providing means for a user to pull up on when the strap is tightened around the tree.

4,595,077

SCAFFOLD

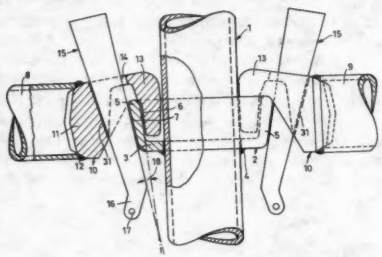
Klaus Buttgereit, Plettenberg, Fed. Rep. of Germany, assignor to Plettac GmbH, Stahlbau und Gesenkschmiede, Plettenberg, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,412

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236648

Int. Cl.[4] E04G *7/30*

U.S. Cl. 182—179 **14 Claims**



1. A scaffold, particularly for construction works, comprising a plurality of vertical tubular bars and a plurality of horizontal and diagonal locking tubular bars, each vertical tubular bar being provided with a plurality of flanges rigidly mounted thereon for fastening the horizontal and diagonal locking bars to the vertical bar, each flange having a bottom portion with an opening through which the vertical bar passes, and a peripheral portion extended upwardly from said bottom portion and radially outwardly from said opening, said horizontal and diagonal locking bars each having an end carrying a locking pawl having a hook which extends downwardly and in assembly engages with the peripheral portion of the respective flange from an inner surface thereof; and a plurality of wedges each being vertically insertable into the respective pawl from above to rest against an outer surface of said peripheral portion to lock the pawl with the respective flange, the peripheral portion gradually converging downwardly in cross-section from an upper edge thereof to said bottom portion and having thereby a greater thickness in the region of the upper edge thereof than in the region of the bottom portion of the flange.

4,595,078

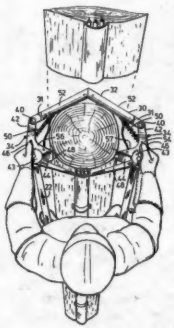
FALL ARREST DEVICE FOR POLE CLIMBERS

William E. Greenway, c/o General Delivery, Millgrove, Ontario, Canada (L0R 1V0)

Continuation-in-part of Ser. No. 669,141, Nov. 7, 1984, which is a continuation-in-part of Ser. No. 611,239, May 17, 1984, abandoned. This application Feb. 21, 1985, Ser. No. 703,851

Int. Cl.[4] A62B *35/00*

U.S. Cl. 182—9 **20 Claims**



1. A fall arrest device for a pole climber comprising; a main yoke member for engaging a pole and lying in a plane, two arms pivotally connected to respective opposite ends of the yoke member for further engaging said pole, each arm being rotatable relative to the yoke member about an axis generally perpendicular to the plane of the yoke member, each arm having resiliently biased means associated therewith for resiliently biasing its respective arm about its pivotal axis toward the other arm, the yoke member and the arms each having a pole-engaging means for engaging the pole, each arm having handle means which can be gripped by the pole climber to rotate the arms about their pivotal axis, and attachment means located on each arm and adapted to be coupled by lanyard means to safety belt connectors, each attachment means being spaced from its respective pivotal connection, whereby, in use, said attachment means, when coupled via said lanyard means to said safety belt connectors, constitutes means effective for providing, in the event of slippage of the pole climber, a force for moving each arm towards the other arm to increase the engagement between the pole-engaging means of each arm and the pole.

4,595,079

TREE CLIMBING PLATFORM

James H. Shope, 8285 Garth Point La., Rapid River, Mich. 49878

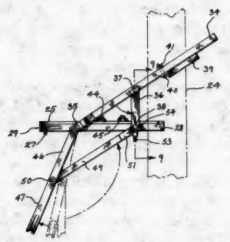
Filed Apr. 8, 1985, Ser. No. 720,830

Int. Cl.[4] A01M *31/02;* A45F *31/26;* A47C *9/10*

U.S. Cl. 182—187 **6 Claims**

1. In a tree climbing platform for hunters and the like, a deck, frame means supporting the deck and including opposed side members, said deck and its frame means in service being disposed generally horizontally and engageable rearwardly with a tree, frame members disposed on opposed sides of the deck and being pivotally connected to the deck frame means side members adjacent to the forward end of the deck, said frame members in service extending angularly upwardly and rearwardly beyond the rearward end of the deck and on opposite sides of the tree, first linkage means pivotally connected to the frame members, bar means secured between the frame members on the far side of the tree and at a higher elevation relative to the deck to render the platform self-supporting in service, a U-shaped member having opposed side legs joined by an intermediate leg, the distal ends of said side legs being

pivotally connected to the opposed deck frame means side members adjacent to the forward end of the deck and said U-shaped member extending angularly downward and forward relative to the deck to place the intermediate leg in position forwardly of the deck in service to serve as a foot rung member, second linkage means pivotally connected to the side legs of the U-shaped member, the said several pivotal connections providing for folding of the platform elements to thereby provide for ease of portability, said platform elements being extendable to their in service condition, and means for securing the distal ends of the first and second linkage means to the deck frame means side members adjacent to the rearward end of the deck to fix the platform elements in their extended in service condition.

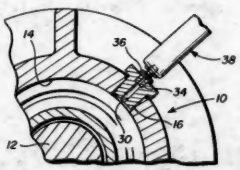


4,595,080

LOW PRESSURE GREASE FITTING ADAPTED FOR REAR HUB BEARINGS

Robert W. Shay, 501 S. W. 2nd St., Hallandale, Fla. 33009

Filed Nov. 2, 1984, Ser. No. 669,331
Int. Cl.[4] F01M *11/04*
U.S. Cl. 184—105.3 **1 Claim**



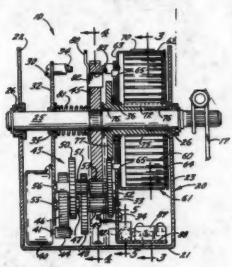
1. The method of at least substantially filling an interior cavity with a lubrication fluid to a predetermined low pressure and through an access bore opening into said cavity by the utilization of a high pressure grease gun, said method including providing an elongated body having first and second end portions and provided with a longitudinal bore formed therethrough with said first end portion being generally circular in cross sectional shape and tapering in diameter toward the free end thereof and said second end portion being diametrically enlarged and the opposite ends of said bore opening endwise outwardly of said first and second end portions and having an endwise outwardly facing grease fitting secured to the end of said bore opening outwardly of said second body end portion, lightly wedgedly seating said first end portion in the outer end of said access bore to define a low pressure fluid seal between said body and the outer end of said access bore, operatively engaging the discharge fitting of a high pressure grease gun with said grease fitting and then actuating said high pressure grease gun to supply grease under high pressure to said grease fitting while applying light yieldable manual thrust pressure to said body, through said grease gun in a direction extending longitudinally of said body to maintain said first end portion seated in said access bore against fluid pressure therein only to said predetermined pressure, and terminating operation of said grease gun as soon as the pressure within said access bore acting upon said first end portion of said body is sufficient to overcome said thrust pressure and initially outwardly displace said one end portion from seated engagement in said access bore.

4,595,081

REVERSIBLE ROTARY ACTUATOR WITH SPRING RETURN

Gerald R. Parsons, Poplar Grove, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Sep. 10, 1984, Ser. No. 648,492
Int. Cl.[4] F03G *1/08*
U.S. Cl. 185—40 R **6 Claims**



1. A reversible actuator comprising a rotatable output shaft, a selectively energizable electric motor having a rotatable drive shaft for rotating said output shaft in one direction when said motor is energized, a gear train having an input gear rotatable with said motor drive shaft and having an output gear rotatable with said output shaft, said gear train including intermediate gear means disposed in driving relationship with said input and output gears, sand torsion spring means operably connected to said intermediate gear means and wound in response to rotation of said intermediate gear means and differentially of torque applied by said intermediate gear means to said output shaft when said motor is energized to rotate said output shaft in said one direction, said spring means unwinding and applying torque to said output shaft through said intermediate gear means to rotate said output shaft in the opposite direction upon de-energization of said motor, a spring drive shaft connected to said spring means to wind said spring means when rotated in one direction and to rotate in the other direction when said spring means unwinds, said spring means winding and unwinding about an axis coinciding with the axis of said spring drive shaft, said gear train further including a second output gear rotatable with said spring drive shaft and rotatable relative to said first output gear, said intermediate gear means including first and second conjointly rotatable intermediate gears disposed in driving relationship with said first and second output gears, respectively, the ratio of said first intermediate gear to said first output gear being different than the ratio of said second intermediate gear to said second output gear.

4,595,082

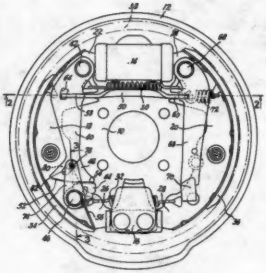
DRUM BRAKE

Gerard Le Deit, Aulnay Sous Bois, France, assignor to Societe Anonyme D.B.A., Paris, France

PCT No. PCT/FR78/00018, § 371 Date Mar. 23, 1979, § 102(e) Date Mar. 23, 1979
PCT Filed Aug. 29, 1978, Ser. No. 289,959
Claims priority, application France, Aug. 29, 1977, 77 26185
Int. Cl.[4] F16D *65/54*
U.S. Cl. 188—79.5 P **11 Claims**

1. A drum brake comprising two brake shoes, operating means situated between two first adjoining ends of the shoes, and adjusting means designed to increase automatically the

distance separating the first ends of the shoes as a function of the wear on linings carried by the shoes, the adjusting means comprising a lever pivoted at one end on a first one of the shoes in the vicinity of the operating means, a pawl pivoted on the first shoe and meshing with a toothed sector formed on the other end of the lever under the influence of resilient means, and an operating member responsive to the distance between the said first ends of the shoes so as to pivot the lever in a direction corresponding to adjustment of the brake, wherein



abutment means are provided to prevent pivoting of the lever through more than a predetermined angle relative to the position occupied by the lever when idle and when the linings carried by the shoes are new, second resilient means being associated with the operating member to absorb the force transmitted by the latter when the lever is abutting on the abutment means, and the abutment means comprise at least one rigid member extending between the lever and the first shoe to form an operative connection therebetween.

4,595,083

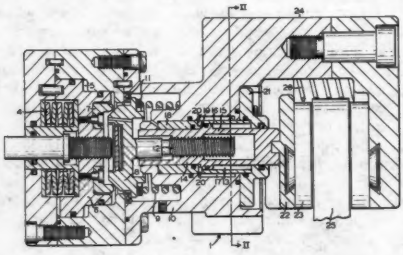
BRAKE ACTUATOR DEVICE HAVING A HYDRAULIC SLACK-ADJUSTING ARRANGEMENT

Robert Mackenzie, Toronto, and Thomas Digweed, Beamsville, both of Canada, assignors to WABCO Ltd., Hamilton, Canada

Filed Nov. 19, 1984, Ser. No. 672,962

Int. Cl.[4] F16D *65/56, 65/74*

U.S. Cl. 188—196 C **16 Claims**



1. A hydraulic fluid operated disk brake actuator having a hydraulic slack-adjusting arrangement for maintaining a positive clearance between a brake shoe and a brake disk, said brake actuator comprising:

(a) an actuator housing;

(b) brake-applying means disposed in said actuator housing for exerting an axially directed braking force;

(c) hydraulic piston means disposed adjacent said brake-applying means for exerting a brake-releasing force in opposition to such braking force upon communication of such hydraulic fluid thereto and for transmitting such braking force when such hydraulic fluid is removed from communication with said hydraulic piston means;

(d) an actuator piston reciprocally movable within a piston chamber formed in said actuator housing;

(e) a rotatable threaded spindle member threadably-connected to said actuator piston;

(f) clutch means connected partially to said hydraulic piston means and partially to said spindle member for transmitting, when engaged, such braking force from said hydraulic piston means to said actuator piston;

(g) first storing means in communication with said piston chamber for storing a fixed amount of hydraulic fluid as corresponds in volumn to a displacement of a nonworn brake shoe during a brake application, said first storing means including a shuttle member movable within a shuttle chamber between a release position and an application position;

(h) second storing means in communicatcn with said first storing means and formed as a portion of said piston chamber for storing a second amount of hydraulic fluid, such second amount of hydraulic fluid being variable in volumn as a function of a volumetric wear of the brake shoe during continued brake applications;

(i) fluid supply means for providing such variable second amount of hydraulic fluid during brake application and for blocking return of such variable second amount of hydraulic fluid during brake release; and

(j) fluid-directing means for directing such first and second amounts of hydraulic fluid into said piston chamber and said second storing means during a brake application and for directing such first amount of hydraulic fluid back into said first storing means during a brake release.

4,595,084

DRUM BRAKES

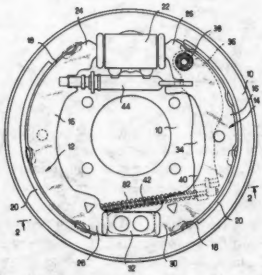
Gérard Le Deit, Courtry, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Oct. 15, 1984, Ser. No. 661,496

Claims priority, application France, Oct. 26, 1983, 83 17097

Int. Cl.[4] F16D *51/00*

U.S. Cl. 188—328 **2 Claims**



1. In a mechanical actuator linkage for separating adjacent ends of a pair of brake shoes carrying friction linings for engagement with a rotatable drum, and at least one of said shoes having a radial web, the improvement comprising a lever including a body portion of substantial longitudinal length having opposite first and second ends, said body portion adjacent said first end having an opening adapted to receive a pivotal connection with said radial web of said one brake shoe and having at said second end first and second longitudinally extending fingers separated by a longitudinally extending slot, said first finger reversely bent to form a U-shaped trough and a free end of said first finger extending in a plane substantially parallel to a plane defined by the longitudinal length of the

body portion, the free end being disposed a predetermined distance from an adjacent surface of the body portion so that a cable is received within said trough, the cable having a boss of predetermined longitudinal length attached to said cable and the boss abutting a transverse side of the first finger so that the boss is positioned below and enclosing an open end of the longitudinally extending slot, the second finger bent substantially perpendicular relative to the adjacent surface of the body portion so that a free end of the second finger extends above the boss and no further than said predetermined distance from said adjacent surface, the second finger bent to extend on a side of the lever having said adjacent surface and providing a flat transverse surface engaging a longitudinal portion of the predetermined longitudinal length of said boss so that the boss is secured relative to movement toward the first end of the lever and the cable captured in the trough.

4,595,085

DEVICE FOR ACTUATING A DISC BRAKE WITH AUTOMATIC ADJUSTMENT

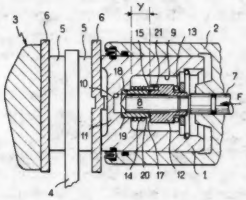
Claude Le Marchand, Domont, and Jean-Pierre Gautier, Aulnay/bois, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Aug. 23, 1984, Ser. No. 643,595

Claims priority, application France, Sep. 13, 1983, 83 14507

Int. Cl.[4] F16D *65/56*

U.S. Cl. 188—71.9 **4 Claims**



1. A device for actuating a disc brake with automatic taking-up of play resulting from wear of friction linings, incorporating:

a hollow piston defining an inner cavity with a bottom;

a mechanically actuatable threaded rod extending coaxially into the cavity of said piston;

a tapped sleeve threadably engaged on said threaded rod and movable with the piston during actuation of the piston, said sleeve having an annular frontal bearing surface;

a helical clutch-spring forming a uni-directional clutch operatively coupled to said tapped sleeve and allowing said sleeve to rotate relative to the threaded rod and piston only in a direction corresponding to displacement of said sleeve toward the bottom of said piston; and

a cylindrical bearing member interposed between said frontal bearing surface of said sleeve and the bottom of said piston, said cylindrical bearing member having an end portion force-fitted into the bottom of said piston and a projecting portion extending into the cavity of said piston, said helical clutch-spring mounted on said projecting portion and comprising an end arm connected to said sleeve.

4,595,086

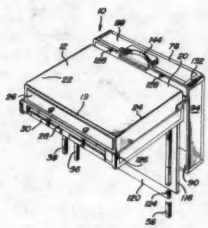
PORTABLE DESK-WORK BENCH WITH CARRYING CASE

Lewis H. Simpson, c/o L.H.S. Enterprises, 949 Grant St. - Box 5, Benicia, Calif. 94510

Filed May 31, 1984, Ser. No. 615,804

Int. Cl.[4] A47B *3/10*

U.S. Cl. 190—11 **8 Claims**



1. A portable desk, work table and carrying case combination including a top unit defining an upper work surface and having front, rear and opposite side marginal portions, a downwardly opening cover also having front, rear and opposite side marginal portions, support means hingedly supporting the rear marginal portion of said cover from the rear marginal portion of said top unit for swinging about an axis generally paralleling said rear marginal portions between a closed position closely overlying said top unit from above and an open position extending upwardly from said rear marginal portion, said support means also including means supporting said cover from said top unit for shifting of said cover, after it has been swung to said open position, relative to said axis and the top unit along a path extending between said front and rear marginal portions of said cover to a position with axis closely adjacent said front marginal portion of said cover and said cover dependingly disposed at generally right angles relative to said top unit, having its front marginal portion disposed to the rear of said top unit rear marginal portion and the rear marginal portion of said top unit lowermost, the portion of the top unit disposed below said abutment surfaces defining forwardly opening drawer compartment means, said drawer compartment means including a pair of laterally spaced apart forwardly opening opposite side lower drawer compartments, said top unit defining a center front-to-rear extending downwardly opening cavity between said opposite side lower drawer components and a pair of opposite side front-to-rear extending downwardly opening cavities between remote sides of said lower drawer compartments and said side marginal portions of said top unit, a pair of collasped side legs housed in said side compartments and a collapsed front center leg housed in said center compartment, said legs being extendible and positionable in depending operable positions extending downwardly from the respective compartments for support of said top unit in elevated position from upwardly facing surface portions from which the lower ends of said legs are supported.

4,595,087

DOG CLUTCH CONSTRUCTION WITH CIRCULARLY UNIFORM CONSTRUCTION COUPLING CLUTCH SLEEVE AND ACTUATING PISTON

Kunio Morisawa, and Tadashi Kondo, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 21, 1984, Ser. No. 582,100

Claims priority, application Japan, Feb. 26, 1983, 58-031627; Mar. 5, 1983, 58-036289; Sep. 21, 1983, 58-174838

Int. Cl.[4] F16D *13/22*

U.S. Cl. 192—67 R **10 Claims**

1. In a transmission device comprising a casing, a power input shaft and a power output shaft, both said power input

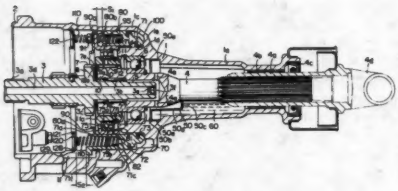
shaft and said power output shaft being rotatably and coaxially mounted within said housing along a central axis thereof with inner end portions of said power input shaft and said power output shaft being positioned close to one another, the improvement which comprises:

a dog clutch construction comprising:

a first dog clutch member supported by said power input shaft and having an outer diameter and a number of teeth;

a second dog clutch member of substantially the same outer diameter as said first dog clutch member and having the same number of teeth as said first dog clutch member, said second dog clutch member being supported by said power output shaft, said first and second dog clutch members being juxtaposed along said central axis;

a sleeve generally formed as a hollow cylinder with an inner diameter which is substantially equal to the outer diameters of said first and second dog clutch members, said sleeve including teeth on an inner surface thereof which correspond in number and spacing to said teeth on said first and second dog clutch members, said sleeve being fitted over said first and second dog clutch members so as to be slidable thereon along said central axis between a first extreme axial position and a second extreme axial position, in said first extreme axial position said sleeve being located over and being rotationally engaged to only said first dog clutch member, and in said second extreme axial position said sleeve being located over and being rotationally engaged to both said first and said second dog clutch members;



a dog clutch drive assembly comprising an annular power piston adapted to reciprocate in an annular pressure chamber, said annular pressure chamber being formed in said housing along said central axis, said annular power piston having a pressure receiving surface at one axial end thereof, said dog clutch drive assembly further comprising an annular axial force transmitting subassembly arranged along said central axis and engaged with said piston so as to be movable relative to said piston along said central axis within a predetermined range under a biasing force for biasing said piston relative to said axial force transmitting subassembly along said central axis in a direction to reduce the volume of a part of said pressure chamber to which said pressure receiving surface of said piston is exposed and said axial force transmitting assembly also being engaged with said sleeve so as to drive said sleeve axially along said central axis while allowing said sleeve to rotate freely around said central axis; and

a means for driving said dog clutch drive assembly along said central axis for selectively either rotationally connecting said power input shaft to said power output shaft through said first and second dog clutch members and said sleeve or disconnecting said power input shaft from said power output shaft, said means for driving comprising a means for selectively supplying said pressure chamber with pressurized fluid, and a means for biasing said piston relative to said housing along said central axis in a direction which will reduce the volume of a part of said pressure chamber to which said pressure receiving surface of said piston is exposed.

4,595,088

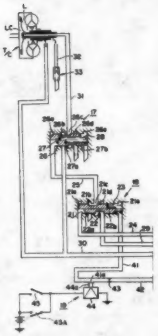
HYDRAULIC CONTROL SYSTEM FOR LOCK-UP CLUTCH

Kazuhiko Sugano, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 6, 1983, Ser. No. 539,695

Int. Cl.[4] B60K *41/02*

U.S. Cl. 192—0.076 **3 Claims**



1. A hydraulic control system for a lock-up clutch of a hydrodynamic device of an automatic transmission for a vehicle having an engine with a control member variable, in position, in response to a power demand of the engine, comprising:

means for generating a governor fluid pressure indicative of a speed of the vehicle;

a valve having a spool movable responsive to said governor fluid pressure, said spool being movable between a lock-up position and a non lock-up position;

means coupled with said valve for hydraulically engaging the lock-up clutch when said spool assumes the lock-up position thereof and releasing the lock-up clutch when said spool assumes the non lock-up position thereof;

means responsive to the position of the control member for generating an output signal when the position of the control member attains a predetermined value; and

means coupled with said valve and responsive to said output signal for overriding said valve to move said spool to the non lock-up position thereof.

4,595,089

WEAVING MACHINE

Alois Steiner, Rieden, Switzerland, assignor to Sulzer-Ruti Machinery Work, Ltd., Ruti, Switzerland

Filed Jan. 22, 1985, Ser. No. 693,092

Claims priority, application European Pat. Off., Jan. 25, 1984, 84100750.3

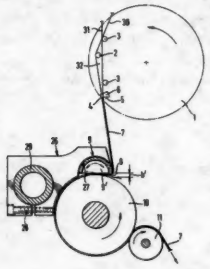
Int. Cl.[4] D03D *47/00*

U.S. Cl. 139—11 **19 Claims**

1. In a series-shed weaving machine, the combination comprising

a plurality of beating-up lamella, each of said lamella having a beating-up edge for beating-up a weft yarn into a cloth,

each edge being disposed in perpendicular relation to the plane of the cloth during beating-up; and



means for pulling the cloth in a take-off direction at at least the peripheral velocity of each said edge after beating-up of a weft yarn.

4,595,090

DEVICE FOR CHANGING MODEL PLATES IN MOLDING MACHINES

Rüdiger Ottowell, Bochum, Fed. Rep. of Germany, assignor to Georg Fischer AG, Schaffhausen, Switzerland

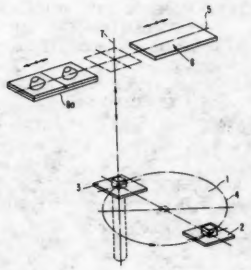
PCT No. PCT/CH82/00137, § 371 Date Sep. 16, 1983, § 102(e) Date Sep. 16, 1983, PCT Pub. No. WO83/02410, PCT Pub. Date Jul. 21, 1983

PCT Filed Dec. 23, 1982, Ser. No. 537,405

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1982, 3201447

Int. Cl.[4] B65G *47/00;* B29C *33/34*

U.S. Cl. 198—346.2 **13 Claims**



1. An apparatus for changing model plates in a molding machine, comprising:

feed means, including carriages, for conveying model plates in a horizontal direction on said carriages, said carriages having a longitudinal axis;

rotatable conveyor means for horizontally moving model plates between a lifting site and a molding site and along a pivot field circle; and

lifting means, at said lifting site, for moving model plates between said lifting site on said rotatable conveyor means and one of said carriages of said feed means along a vertical, axis intersecting said longitudinal axis and said pivot field circle.

4,595,091

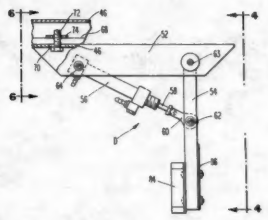
ARTICLE DIVERTER

Stephen D. Scopatz, and Ian A. Brown, both of Three Rivers, Calif., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 2, 1984, Ser. No. 606,112

Int. Cl.[4] B65G *47/34, 47/82, 17/24*

U.S. Cl. 198—372 **9 Claims**



1. Article diverter for high speed diversion of articles from a moving line including

conveying means for transporting said articles,

support means mounted transversely over said moving line for supporting said article diverter over said conveying means in article diverting relationship thereto, said diverter comprising

mounting means for slidably adjustably mounting said diverter to said support means along the length thereof transversely to said conveying means,

a piston assembly having a first end pivotably mounted to one end of said mounting means forming a first pivot point,

an ejector lever having one end pivotably mounted to other end of said mounting means forming a second pivot point, the distance between said first pivot point and said second pivot point on said mounting means being fixed, said ejector lever having a resilient pad secured thereto at the other end thereof for impacting said articles,

said piston assembly having a second end pivotably mounted to said ejector lever at a point intermediate said resilient pad and said second pivot point forming a third pivot point,

means for actuating the piston of said piston assembly for providing a diverting stroke and a retracting stroke,

whereby said resilient pad traverses an arcuate path during said diverting and retracting strokes, each of said arcuate paths being substantially lengthier than the distance traveled by said piston during either of said diverting or retracting strokes.

4,595,092

LOAD-PUSHER ASSEMBLY FOR CONVEYOR SYSTEMS

Thomas A. Dyer, Greenwood, Ind., assignor to Pentek Corporation, Indianapolis, Ind.

Continuation of Ser. No. 391,960, Jun. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 164,610, Jun. 30, 1980, abandoned. This application Feb. 28, 1985, Ser. No. 706,246

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—456 **21 Claims**

16. In a conveyor system providing a conveyor path and means for transporting atricles along the conveyor path, a load-centering assembly comprising

first and second trolleys, each trolley including means for engaging articles transported along the conveyor path, a first carriage adjacent one end of each article-engaging means, and a second carriage adjacent the other end of each article-engaging means,

track means for movably guiding the carriages in a direction transverse to the conveyor path,

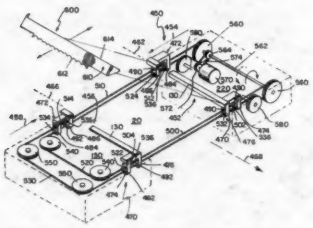
bidirectional drive means for interconnecting the carriages

to apply substantially equivalent drive forces to each carriage during a load-centering activity cycle so that both trolleys move simultaneously along the track means in opposed directions at substantially the same speed causing both carriages of each trolley to remain in alignment during centering and separating movement of the trolleys, and said bidirectional drive means includes:

a power means and drive linkage means connecting said trolleys and transmitting drive forces from said power means to said trolleys,

a first idler linkage connecting the first carriage of the second trolley to the second carriage of the first trolley, and

a second idler linkage connecting the second carriage of the second trolley to the first carriage of the first trolley, the



first and second idler linkages applying substantially equivalent driving force to the second and first carriages, respectively, of the first trolley in response to movement of the second trolley in the first direction so that the first and second trolleys move simultaneously in opposed directions along the tracks toward one another at substantially the same speed during an initial stage of a load-centering activity, the first and second idler linkages applying substantially equivalent driving force to the first and second carriages, respectively, of the second trolley response to movement of the first trolley in the first direction so that the first and second trolleys move simultaneously in opposed directions along the tracks away from one another at substantially the same speed during a final stage of said load-centering activity.

4,595,093

PACKAGE OF COMPRESSED RESILIENT ARTICLES AND CONCOMITANT METHOD OF UNPACKAGING

Joseph H. Eckstein, Sunman, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 6, 1984, Ser. No. 568,853
Int. Cl.[4] B65D *71/06*
U.S. Cl. 206—44 R **12 Claims**

1. A package comprising:

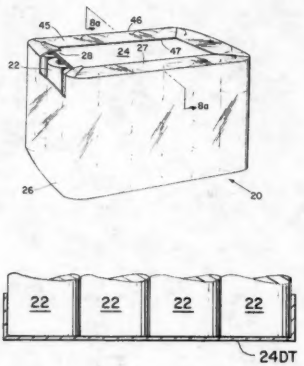
a constrained array of radially compressed, radially resilient rolls of tissue paper product, each of said rolls comprising a length of tissue paper wound onto a cylindrical core having an axis of rotation, said rolls being disposed with their axes of rotation in parallel relation;

a convertible support panel disposed against an end of said array with said axes of rotation disposed perpendicular thereto, said support panel being a planar panel which is folded to have a plane size area no greater than said end of said constrained array, and sufficiently large to be unfolded and formed into a display tray of sufficient area to accommodate said end of said array when said array becomes unconstrained and expanded due to the radial resilience of said rolls of tissue paper;

an array constraining enclosure of flexible sheet material, said array being constrained by and within said enclosure with said rolls radially compressed until removal of said enclosure.

12. A method of unpackaging a package comprising an array constraining enclosure of sheet material, an array of compressed resilient articles constrained within said enclosure, and a convertible support panel juxtaposed the bottom end of said array, said support panel being convertible to form a display tray of sufficient size to accommodate said array upon said array becoming unconstrained and expanded due to the resilience of said articles when said enclosure is removed, said method comprising the steps of:

orienting the package so that said support panel faces upwardly;



releasing said support panel from said package while continuing to constrain said array within said enclosure;

converting said support panel into said display tray;

placing said display tray bottom-side up over the upwardly facing bottom end of said array; righting said array, enclosure, and display tray as a unit; and

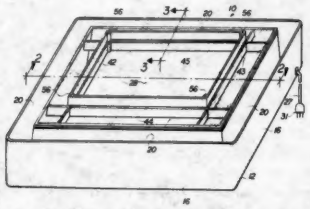
removing said enclosure to release said constraining of said array.

4,595,094

DISPLAY STAND FOR AN ICE CARVING OR LIKE STRUCTURE

Winston Reid, Miami, Fla., assignor to Poseidon Maritime Services, Inc., Miami, Fla.

Filed Nov. 26, 1985, Ser. No. 801,708
Int. Cl.[4] B65D *5/50*
U.S. Cl. 206—45.14 **15 Claims**



1. A support assembly primarily designed to support and display an ice sculpture or like object, said assembly comprising:

(a) a housing structured and disposed in engaging relation to a supporting surface and including a substantially hollow interior portion,

(b) a support platform mounted on an upper portion of said housing in at least partially covering relation to said hol-

low interior portion and disposed to define an upper exposed surface of said housing,

(c) said support platform formed at least in part from a light permeable material disposed in overlying relation to said hollow interior portion,

(d) illumination means mounted witin said hollow interior portion and disposed to direct light through said light permeable material, whereby display of an object on said display platform is enhanced by illumination thereof,

(e) collection means formed on said housing adjacent to and at least partially below said support platform for collection of liquid melted from the ice sculpture,

(f) said collection means comprising a trough positioned immediately adjacent an outer peripheral edge of said support platform and in liquid receiving position for liquid falling from said support platform, whereby liquid draining from the ice sculpture will be collected in said trough.

4,595,095

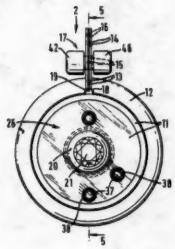
CASE FOR JEWELRY AND/OR GEMSTONES

Philip Y. T. Lam, P.O. Box 96259 T.S.T., Room 1107, Hong Shing Bldg., 363-373 Nathan Rd., Kowloon, Hong Kong

Filed Jul. 24, 1984, Ser. No. 633,951

Int. Cl.[4] B65D *25/54, 61/00;* **A45C** *11/16*

U.S. Cl. 206—45.34 **10 Claims**



1. A case for jewels and/or gemstones comprising a bottom case portion, an upper case portion, a holder surrounding peripheries of the case portions for holding the case portions together and locking means for locking the holder in its operative condition, said upper case portion being provided internally with plates for supporting the jewels and/or gemstones, said plates comprising an upper plate spaced from an upper wall portion of said upper case portion and defining therewith a space in which jewel and/or gemstone items are located, and a lower plate spaced from said upper plate and defining therewith a second space in which a main jewel or gemstone is located, said lower plate being held in position by a wire retaining member engaged with the upper case portion.

4,595,096

INTEGRATED CIRCUIT CHIP CARRIER

F. Nihal Sinnadurai, Woodbridge; Anthony J. Cook, Dippenhall, Nr Farnham, and Keith W. Gurnett, Bracknell, all of England, assignors to British Telecommunications, London, England

Division of Ser. No. 342,358, Jan. 25, 1982, Pat. No. 4,448,306. This application Dec. 20, 1983, Ser. No. 563,622

Claims priority, application United Kingdom, Feb. 9, 1981, 8103840

The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.

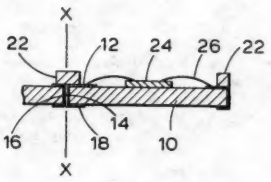
Int. Cl.[4] B65D *73/02, 85/42*

U.S. Cl. 206—331 **6 Claims**

1. A leadless chip carrier for physically mounting an integrated circuit chip and for providing electrical circuit connections thereto, said carrier comprising:

base of plastics material having edges about its periphery and having opposed top and bottom surfaces,

a side wall of plastics material connected to the top surface of the base so as to be coterminus with at least part of the base periphery and extending about an enclosed area thereon so as to define an integrated chip mounting cavity on said base, and



a pattern of metallized electrical contact areas formed on and supported by the top surface of said base and comprising a plurality of tracks of conductive material extending from first connecting points on said top surface within said chip mounting cavity around the edges of said base and on to second connecting points outside the chip mounting cavity located on the bottom surface of the base.

4,595,097

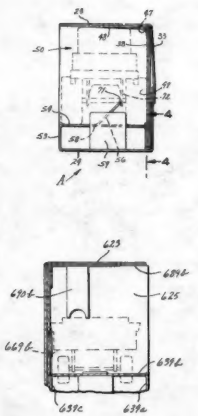
TOY PACKAGING

Barry S. Herstein, Spring Valley, N.Y., assignor to Buddy L Corporation, New York, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,267

Int. Cl.[4] B65D *85/68, 5/50*

U.S. Cl. 206—335 **7 Claims**



1. A package for a toy vehicle having a body and front and rear wheels for providing secure, open front display of the packaged vehicle, the package being constructed of carton-forming sheet material and having top, bottom, side and rear walls defining a toy vehicle-receiving enclosure having an open front through which the toy vehicle is insertable and visible for display purposes, with said vehicle being presented with a front and a rear wheel proximate said rear wall, said bottom wall having a bottom flap extending inwardly of the enclosure from a line of folding constructed to define a floor therefor located upwardly of said bottom wall, at least one locking tab formed in said bottom wall and being bendable

upwardly from a first line of weakness in the plane of said bottom wall, said bottom flap having at least one vehicle-engaging tab formed therein bendable upwardly and extending rearwardly from a second line of weakness in the plane of said floor of said bottom flap and having a free inner end for engaging the proximate wheel of the vehicle on the inner surface thereof for maintianing said vehicle against displacement, said vehicle-engaging tab having a slot located spacedly from the vehicle-engaging free end, said locking tab having an outer portion sized and located to extend through said slot and an inner portion constructed to engage said vehicle-engaging tab between the end thereof and said slot form maintaining said vehicle-engaging tab in vehicle-locking orientation.

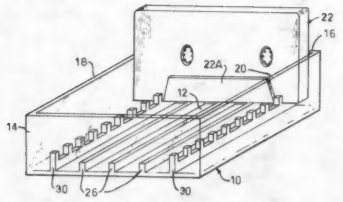
7. A package for a toy vehicle having a body and front and rear wheels for providing a secured, open front display of the packaged vehicle, the package being constructed of carton-forming sheet material and having top, bottom, side and rear walls defining a toy vehicle-receiving enclosure having an open front through which a toy vehicle is insertable and visible for display purposes with said vehicle being presented with a front and a rear wheel proximate said rear wall, said bottom wall having a bottom flap, first, second and third parallel lines of weakness for dividing said bottom flap into three areas, whereby upon folding about said lines of weakness said three areas are constructed to respectively define a base below said open front, a floor upwardly of said bottom wall, and an inner end portion extending downwardly in substantially planar parallel relationship to the rear wall, said floor being provided with apertures sized for receiving lower parts of the wheels on the outer side of the vehicle, said floor being dimensioned for extension over only a portion of the bottom wall whereby said inner end portion is disposed spacedly from the rear wall to define a zone for receiving lower parts of the wheels adjacent the rear wall of said package, said floor having at least one slot extending rearwardly, and at least one locking tab formed in said bottom wall and being bendable upwardly from a fourth line of weakness in the plane of said bottom wall, said locking tab having at a free end thereof a reduced central portion sized for extension through said slot and with the portions adjacent either end of said central portion sized to form shoulders for engaging the proximate under surface of said floor.

4,595,098

STORAGE CASE FOR MAGNETIC TAPE CASSETTES, THEIR BOXES AND THE LIKE

Karl D. Kryter, P.O. Box 750, Bodega Bay, Calif. 94923

Filed Dec. 13, 1984, Ser. No. 681,445
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 **14 Claims**



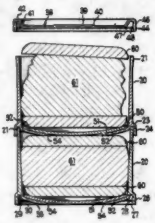
1. A storage device for storing magnetic tape cassettes and their boxes, each of which boxes is adapted to hold an individual magnetic tape cassette, comprising: a bottom portion which includes at least one section capable of receiving a plurality of magnetic tape cassettes or a plurality of their boxes, said section including a bottom wall having a plurality of parallel ribs extending upwardly therefrom, the spacing between adjacent ribs being slightly greater than the width of the cassette boxes whereby cassette boxes may be stored in an upright position on the bottom wall between adjacent ribs, one pair of said ribs being higher than the other ribs extending upwardly above said other ribs, and means forming spaced notches along the upper edge of said higher ribs which notches have a width slightly greater than the width of portions of the cassette tapes for support of cassette tapes in an upright position and a direction transversely to the parallel ribs.

4,595,099

SANDWICH PREPARATION AND STORAGE CONTAINER SET

John V. Zaruba, Chicago; Howard J. Morrison, Deerfield, both of Ill., and Rino Conti, Stoughton, Mass., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 1, 1985, Ser. No. 697,284
Int. Cl.[4] B65D *85/60, 85/78*
U.S. Cl. 206—525 **12 Claims**



1. A sandwich preparation and storage container set comprising:

an open top shell of a first material and having a predetermined height with an interior opening of a predetermined size;

an upper rim on the shell surrounding the open top;

a partial bottom wall extending inwardly from the shell forming an inner face of a predetermined contour and a generally centrally disposed aperture;

cover means engagable with the upper rim to substantially seal the open top; and

an insert of a second material more rigid than the first material and having a periphery that substantially conforms with the opening of the hollow member, a substantially continuous, unobstructed top face, and a bottom face with a contour that substantially conforms with the contour of the inside face of the bottom wall of the shell to seal the aperture.

4,595,100

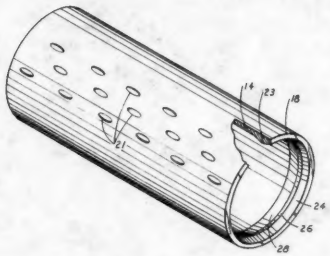
COIN HOLDER

Paul-André Chabot, 736 Baker Street, Vanier, Canada G1M 2T9

Filed Sep. 7, 1984, Ser. No. 648,217
Int. Cl.[4] B65D *83/04, 85/58;* **G07D** *9/00*
U.S. Cl. 206—0.82 **2 Claims**

1. A one-piece coin holder made of slightly elastic and flexible material for holding a stack of a predetermined number of coins of like diameter and thickness, said holder having a main cylinder wall, a closure wall at one end and an opposite open-end portion, the latter permitting insertion or egress of said coins into and from said holder, said open-end portion defining an inner, continuous, apertureless, circular bulge having an intermediate cylindrical face, outer and inner bevelled faces flaring away from said intermediate face, said inner bevelled face merging with the inside surface of said main wall and with said intermediate cylindrical face, the inner diameter of said main wall being slightly larger than the diameter of said coins, such that the latter can be freely stacked therein, the inner diameter of said intermediate cylindrical face being slightly smaller than the diameter of said coins, such that said intermediate cylindrical face will frictionally engage the peripheral

edge of the endmost coin of the stack, said inner bevelled face having a width larger than the thickness of said coins, and frictionally engaging the peripheral edge of the coin next following the endmost coin of the stack, so that at least said



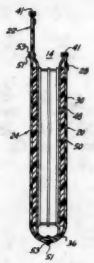
two endmost coins of the stack form a plug which retains the remaining freely-held coins in the holder under normal handling of the coin-filled holder, said plug being released from frictional engagement with said inner and intermediate faces upon sufficient outward pressure exerted on said plug.

4,595,101

PORTABLE FOOD CARRYING DEVICE

Henry C. Rivera, 700 Pueblo Rd., Milford, Mich. 48042

Filed Jul. 2, 1984, Ser. No. 627,189
Int. Cl.[4] B65D *81/38*
U.S. Cl. 206—545 **4 Claims**



1. A portable food carrying device comprising:

a low profile, insulated, flexible container comprising:

a planar top, a planar bottom, and a plurality of planar sides connecting said top and said bottom, one of said sides being open;

said top side and said bottom side of said device having a pair of short edges and a pair of long edges in a substanfially rectangular shape and being the largest sides of said device;

a low profile rack received into the open side for providing a skeletal support for said flexible container and for supporting food apart from the interior of said container;

said rack comprising:

a frame including a bottom element forming substantially rectangular first member, said first member including a plurality of spaced parallel wires linking two parallel opposing sides of said bottom for supporting said food;

a top element positioned above said bottom element forming a substantially rectangular second member including a plurality of spaced, parallel situated wires linking two parallel opposing sides thereof;

a middle element positioned between said top and said bottom elements comprising a substantially rectangular third member including a plurality of spaced wires linking opposing parallel sides thereof;

wherein said top, middle and bottom elements comprise rounded corners;

a plurality of vertical support members joining opposing corners of said bottom element to said middle element to said top element in a spaced apart orientation, said spacing sufficient to permit receipt of said food therein, through said open side after said rack has been inserted within said container;

self-leveling carrying means for carrying said container and said rack therein; wherein the top surface of said container includes two pairs of spaced openings, one pair being disposed along each long edge, the distance between the openings along the long edge in each pair being equal to or greater than the distance between the openings along the short edge, and wherein said self-leveling carrying means comprises an elongated handle situated approximately equidistant from particular ones of said openings, a plurality of ropes extending from each end of said handle through an oppositely situated pair of openings, and running underneath the top surface of said device, wherein said ropes are joined one to the other forming a continuous filament;

wherein said top, bottom and said side include:

an inner layer of flexible heat reflective material;

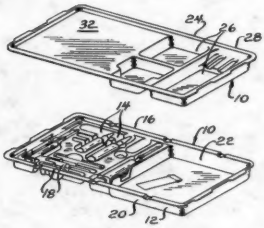
a layer of flexible insulative material applied over said inner layer, and an outer layer of relatively impermeable flexible material applied to said insulative material.

4,595,102

KIT FOR PERFORMING A MEDICAL PROCEDURE

James P. Cianci, Cary; James L. Jessup, Elk Grove Village, and Daniel J. Seeley, Barrington, all of Ill., assignors to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 683,057, Dec. 18, 1984, abandoned.
This application Nov. 21, 1985, Ser. No. 800,496
Int. Cl.[4] B65D *85/62*
U.S. Cl. 206—572 **1 Claim**



1. A kit for performing a medical procedure, comprising:

a lower procedure tray having a component portion defining a plurality of recesses, said component portion extending the width of the procedure tray at one end of the tray, said procedure tray having an outwardly directed extension defining a cavity spaced from the component portion of the procedure tray, said cavity extending the width of the procedure tray at the other end of the tray;

a plurality of procedural components received in the recesses of the procedure tray;

an upper prepping tray having a component portion received in the cavity with a plurality of recesses, said component portion of the prepping tray extending the width of the prepping tray at one end of the prepping tray, said recesses of the prepping tray extending the depth of the procedure tray cavity, said component portion of the prepping tray being disposed in a side-by-side relationship with the component portion of the procedure tray, said prepping tray having an outwardly directed upper generally planar transparent flange extending from the component portion of the prepping tray which is sufficiently

large to cover the component portion of the procedure tray, said flange extending the width of the prepping tray at the other end of the prepping tray; and

a plurality of prepping components received in the recesses of the prepping tray.

4,595,103

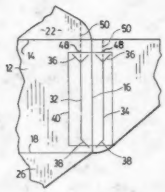
ENVELOPE

Yoon C. Owh, 388 Fleetwood Drive, Oshawa, Ontario, Canada (L1K 1C3)

Filed Jan. 18, 1985, Ser. No. 692,571

Int. Cl.[4] B65D *27/34*

U.S. Cl. 206—604 **19 Claims**



1. A paper envelope comprising first and second major surfaces having a bounding edge, each major surface having a line of weakness therein adjacent said bounding edge, with said lines of weakness being generally coincident; and

a a thermoplastic foil strip having a fold thermally set therein adhered to each major surface to bridge across said line of weakness therein with said fold coincident with said bounding edge.

4,595,104

SORTING DEVICE

Kiyoaki Takiguchi, Yokohama, Japan, assignor to Computer Services Corporation, Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,883

Claims priority, application Japan, Jul. 9, 1983, 58-124972; Jul. 9, 1983, 58-124973; Jul. 27, 1983, 58-137081

Int. Cl.[4] B07C *1/10, 5/04*

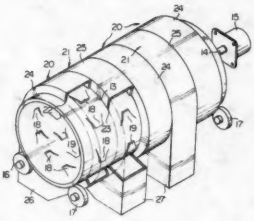
U.S. Cl. 209—548 **7 Claims**

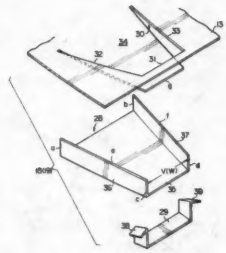
1. A device for sorting out a multiplicity of pieces according to their size, comprising:

a frame;

a sorter drum rotatably mounted in said frame for storing therein pieces having different sizes to be sorted out, said sorter drum having a cylindrical wall;

a plurality of sorting mechanisms on said cylindrical wall and arranged in rows in a circumferential direction of said cylindrical wall, each of said sorting mechanisms being composed of a substantially trapezoidal slit defined in said cylindrical wall and providing a substantially trapezoidal tongue displaced radially outwardly from said cylinderical wall, and a substantially trapezoidal guide body having a holder plate held against said trapezoidal tongue and a pair of slide webs bent from and extending along opposite side edges of said holder plate and fitted in said slit, said holder plate and said slide webs having edges projecting radially outwardly from said cylindrical wall and defining an opening in said cylindrical wall;





means for rotating said sorter drum about its own axis to cause the pieces of the particular size to be discharged through said openings out of said sorter drum.

4,595,105

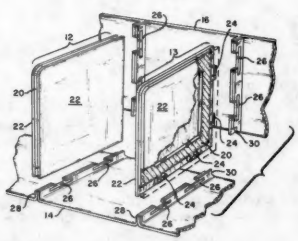
INTERLOCKING BOOKRACK

Kenneth S. Gold, 7721 Nevada Ave., Canoga Park, Calif. 91304

Filed Sep. 12, 1984, Ser. No. 649,740

Int. Cl.[4] A47B *65/00*

U.S. Cl. 211—43 **6 Claims**



1. A collapsible bookrack, for adding onto an existing bookshelf, comprising:

a plurality of rectangular bottom spacers, each having (1) a front edge, (2) a rear edge, (3) two opposed side edges, and (4) bottom fastening means disposed along each of the side edges; said bottom spacers being disposed horizontally side by side,

a plurality of identical flat dividers each disposed vertically above abutting side edges of an adjacent pair of said bottom spacers, each of said dividers having (1) a top edge, (2) a front edge, (3) a bottom edge, (4) divider/bottom-fastening means, disposed along the bottom edge, configured to engage the bottom-fastening means, whereby abutting

side edges of an adjacent pair of said bottom spacers may be removably fastened to the bottom edge of a corresponding one of said dividers, (5) a rear edge, and (6) divider/rear-fastening means disposed along the rear edge, and

a plurality of rear spacers each having (1) a top edge, (2) a bottom edge, (3) two opposed side edges, and (4) disposed along each of the side edges, rear-fastening means configured to engage the divider/rear-fastening means of said dividers whereby abutting side edges of each adjacent pair of said rear spacers may be removably fastened to the rear edge of a corresponding one of said dividers; said rear spacers being disposed vertically side by side, each located above but not directly fastened to the rear edge of a corresponding one of said bottom spacers,

the divider/bottom-fastening means of each of said dividers being contained within a cavity along the bottom edge of the divider and the divider/rear-fastening means being contained within a cavity located along the rear edge of the divider, such that assembly of said bottom spacers requires the bottom-fastening means to be inserted into the cavities in the bottom edges of said dividers to a semi-engaged position from which the dividers must be shifted forward to a fully-engaged position, and assembly of said rear spacers together with said dividers requires the rear-fastening means to be inserted into the cavities in the rear edges of said dividers to a semi-engaged position from which the rear spacers must be shifted downward to a fully-engaged position; whereby, when the bookrack is assembled, all of the fastening means become fully enclosed, and all of said dividers and spacers present completely smooth surfaces with no protrusions inside or outside the bookrack, thus enabling the bookrack to nest unobtusively and space-efficiently into an existing bookshelf to provide the capability of supporting soft-cover booklets and the like effectively in an upright position.

4,595,106

CARRIER STRUCTURE FOR A SUSPENSION CONVEYOR SYSTEM

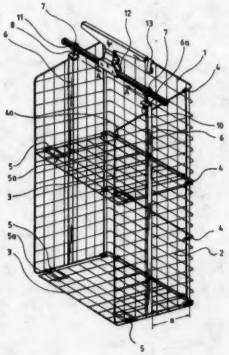
Walter Kunze, Augsburg, and Alfred Hess, Puchheim, both of Fed. Rep. of Germany, assignors to Veit GmbH & Co., Landsberg/Lech, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 677,049

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344659

Int. Cl.[4] A47F *5/08*

U.S. Cl. 211—118 **8 Claims**



1. A rack comprising a carrier bar, a rear wall, a sidewall hingedly connected to each side of said rear wall, and carrier shelves hingedly connected to said rear wall and adapted to be supported by said sidewalls in horizontal position, characterized in that said rack is adapted to be suspended from said carrier bar for suspension conveyance by means of suspension members each connected to said carrier bar and engaging an upper portion of one of said sidewalls at a spaced position from said rear wall, the spacing between said suspension members on said carrier bar being adapted to be altered in such a manner that the angular position of said sidewalls relative to said rear wall is thereby altered between a folded position substantially parallel thereto and at least 90°.

4,595,107

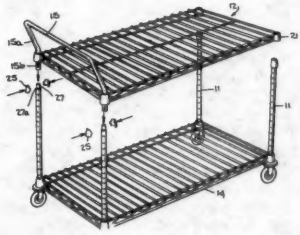
UTILITY CART

John H. Welsch, Springbrook Township, Lackawanna County, Pa., assignor to InterMetro Industries Corp., Wilkes-Barre, Pa.

Filed Nov. 13, 1984, Ser. No. 670,906

Int. Cl.[4] A47F *5/01*

U.S. Cl. 211—187 **29 Claims**



1. A utility cart comprising:

a shelf;

first and second pairs of corner posts;

a handle having a pair of elongate legs;

coupling means for positioning the distal ends of said handle legs in aligned, proximate disposition with respect to the ends of said first pair of corner posts;

first support means adapted to engage the exterior of each of said first pair of corner posts against axial movement relative thereto;

second support means adapted to engage the exterior of each of said second pair of corner posts against axial movement relative thereto; and

means associated with said first support means and the distal ends of said handle legs to interlock said handle and said first support means, whereby said handle and said first pair of corner posts are fixed against removal from said aligned, proximate disposition and whereby said first and second support means engaging respectively said posts of said first and second pairs of corner posts are adapted to support said shelf in horizontal dispostion therebetween.

4,595,108

METHOD FOR STRETCHING AND FOLDING EXTENSION JIB IN WHEELED TYPE CRANE

Yukio Koizumi, and Hiroshi Miyazawa, both of Akashi, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 24, 1983, Ser. No. 460,385

Claims priority, application Japan, Jan. 26, 1982, 57-11329; Apr. 13, 1982, 57-61986

Int. Cl.[4] B66C *23/04, 23/44*

U.S. Cl. 212—267 **3 Claims**

1. A crane, comprising:

a telescopic boom with a fore end, an extension jib assembly mounted on said fore end of said boom, a load hoist mechanism operatively mounted on said telescopic boom and a jib assembly;

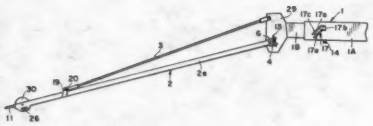
said jib assembly including a suspension-rod-supported com-

pression column type extension jib mounted at the fore end of said boom;

a right and left jib foot portion for holding said jib in a flat horizontal posture in a stretched state and which includes first and second pin slots formed in said left jib foot portion and a third pin slot formed in said right jib foot portion;

first and second boom point pins extending transversely of said boom at the fore end of said boom for selective engagement in said first and third pin slots, respectively, and for rotatably supporting said jib; said first boom point pin having a slot formed therein;

a fixing pin for selective insertion in said third pin slot and in said slot formed in said first boom point pin;



means for disengageably attaching said boom point pins to said jib foot portions;

means for permitting rotation of one of said jib foot portions about an axis extending in a longitudinal direction of said jib and which further comprises a male member and a female member for receiving said male member;

a jib guide mounted on said boom and having an inclined groove and a guided member engageable with said jib guide, said jib guide and guided member being mounted opposingly on the jib folding side of a fixed boom section of said telescopic boom and said jib; and

means for fixing said jib in a folded state on one lateral side of said boom with upper and lower sides of said jib in an upright position.

4,595,109

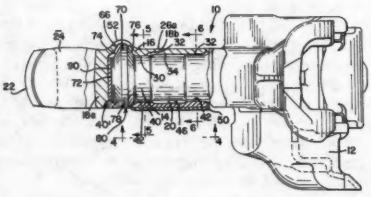
COUPLER FOR ROTARY DUMP CARS

Carl D. McClurg, Lockbourne, Ohio, assignor to Buckeye International, Inc., Columbus, Ohio

Filed Aug. 22, 1983, Ser. No. 525,467

Int. Cl.[4] B61G *9/00*

U.S. Cl. 213—62 A **11 Claims**



1. A coupler for railroad cars comprising:

a coupler head having a spindle extending therefrom toward the railcar on which the coupler head is carried;

said spindle having an enlarged portion adjacent the free end thereof, said enlarged portion having sloped inboard and outboard facing surfaces;

said spindle further having a spaced pair of external bearing surfaces other than said enlarged portion, arranged for rotary contact with a housing means;

said housing means having an inboard portion for receiving a yoke connecting pin and an outboard portion having an elongated cavity for surrounding said spindle;

said outboard portion having an outwardly extending enlarged sidewall configuration adjacent to said cavity for receiving said enlarged portion of said spindle for increased strength of the coupler;

said outboard surface of said spindle arranged to engage surfaces of said enlarged sidewall configuration depending on the presence of tensile forces, said inboard surface of said enlarged portion arranged to bear against the inboard wall of said cavity of said spindle housing through an intermediate filler plate; and

bearing means on said housing means for contacting said spaced pair of bearing surfaces of said spindle to allow rotary movement of said housing means relative to said spindle.

4,595,110

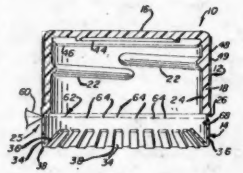
TAMPER-EVIDENT CLOSURE

James E. Herr, East Petersburg, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Continuation of Ser. No. 467,873, Feb. 18, 1983, Pat. No. 4,506,795. This application Feb. 26, 1985, Ser. No. 705,543

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—252 **1 Claim**



1. A tamper-evident closure for sealing an open-topped container having an external screw thread formed on a neck on the container and an outwardly projecting annular shoulder formed below the screw thread, the closure comprising:

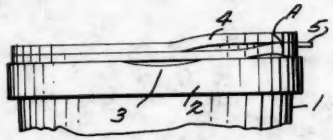
an internally threaded cap which may be removed from the container for dispensing the contents of the container,

the cap comprising a top wall for extending across the open top of the container, an annular sidewall integrally joined to the top wall about the periphery of the top wall and depending therefrom, and an internal screw thread formed on the inside of the sidewall for engagement with the external screw thread on the container, and tamper-indicating means comprising a ring depending from the annular sidewall, said ring being located axially in vertical alignment with said sidewall and radially substantially within the confines of the sidewall so that downward forces during a capping operation do not separate the ring from the cap, said ring having an inner diameter greater than the outer diameter of said shoulder to pass axial therepast during a capping operation, a frangible slit section of reduced cross section in the upper portion of said ring to form breakable connections aligned vertically with the closure annular sidewall for detachably securing the ring to the sidewall, and a plurality of flat tabs bent upward and radially inward from the lower edge of the ring at a folded portion with inner ends of the tabs being disposed radially inwardly of the outer diameter of the shoulder, said upwardly and inwardly inclined tabs being positioned to center the closure relative to the container, said folded portions of said tabs being located at the bottom edge of said ring and being located in vertical alignment with said annular side wall, said inner ends of said tabs being flexed radially outwardly by the shoulder to slide past the shoulder during a capping operation and flexing radially inwardly about the folded portion and to positions for engaging the annular shoulder of the container during removal of the cap to prevent the tamper-indicating means from traveling upward beyond the annular shoulder with the cap and to break the ring away from the cap.

4,595,111
DEVICE FOR REMOVING A FLEXIBLE CAP FROM A CYLINDRICAL NECK

Jerome Gould, Encino, and Thomas W. Kellogg, Irvine, both of Calif., assignors to Dulux Australia Ltd., Victoria, Australia

Filed Dec. 20, 1982, Ser. No. 451,593
Claims priority, application Australia, Dec. 18, 1981, PF2018
Int. Cl.[4] B65D *41/18*
U.S. Cl. 215—303 **1 Claim**

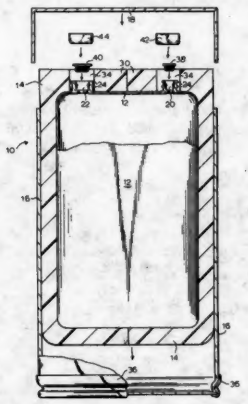


1. In combination with a cylindrical neck having an open end, a replaceable flexible cap friction fitted to said neck, said cap having a circumferential edge for removing the cap by applying axial force to said edge, a discrete flexible ejector element circumferentially slidable relative to said neck in a track defined by and between the edge of the cap and a circumferentially extending shoulder in said neck and cooperating with said edge and said shoulder, the circumferentially extending shoulder being essentially planar and provided with a concave section, the ejector element being essentially ring-shaped and having a lobe receivable by said concave section, the circumferentially extending shoulder and the ejector element being arranged such that the cap is fully received on the neck when the lobe is received in the concave section, and further arranged such that rotation of the ejector causes a camming action between the ejector element and the shoulder thereby urging the lobe and the section of the cap adjacent the lobe axially away from the neck.

4,595,112
THERMAL CONTAINER

Robert A. Dubois, Marion, Ohio, assignor to Greif Bros. Corporation, Delaware, Ohio

Filed Jul. 12, 1984, Ser. No. 630,061
Int. Cl.[4] B65D *5/56, 25/14*
U.S. Cl. 220—5 R **1 Claim**

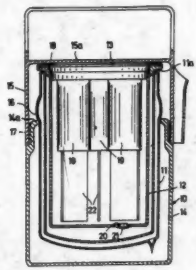


1. A thermal container comprising;
a cylindrical liner blow molded from polyethylene and having a top with two necks and screw type plugs for closing said necks;
an insulating shell formed of two mating members, molded from expanded polystryene, each member having a cavity and a hole, said members cooperating to enclose said liner in their mated position within the cavities, said holes corresponding to said necks; said members being further provided with inserts for closing said holes for covering said necks;
a fiber drum for housing said shell, said drum being dimensioned to fit closely around said shell and further being provided with a circumferential bottom metal chime; and
a fiber cover which fits over said drum to cover said shell.

4,595,113
DEVICE FOR THE STORAGE AND/OR CARRIAGE OF SENSITIVE MATERIALS

Friedrich Fafflok, Paderborn-Neuhaus, and Horst Stangl, Altenbeken-schwaney, both of Fed. Rep. of Germany, assignors to Firma Stangl & Vogt GmbH & Co. KG, Bad Lippspringe, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,251
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 8328443[U]; May 24, 1984, 8415892[U]
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—23.83 **16 Claims**

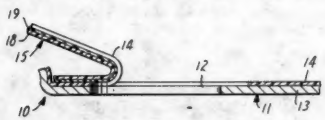


1. A device for the storage and/or carriage of materials, which device is formed from an outer, double-walled, jar-shaped, container having a protective cover and is enclosed by a housing having a screwable lid, wherein an inner container enclosed by the outer container is provided with chambers separated from one another which carry the material, the openings of said chambers being covered by means of superimposed closing discs at a distance from one another and provided with access openings.

4,595,114
TAPE CLOSURE FOR A CAN END

Shih-Lai Lu, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 26, 1985, Ser. No. 727,839
Int. Cl.[4] B65D *17/50, 41/02*
U.S. Cl. 220—260 **6 Claims**



1. A container end assembly comprising
(a) a container end formed of metallic material having an exterior surface and an interior surface and being formed with a pour opening therein;

(b) a coating over at least the exterior surface of said container end, said coating comprising a carboxyl group-containing vinyl chloride/vinyl acetate copolymer composition;

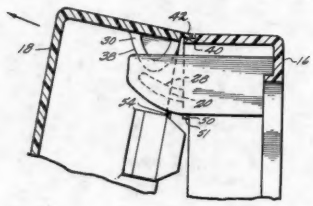
(c) a tape bonded by means of a thermoplastic adhesive to an area of said exterior surface of said coating which is circumjacent and covers said pour opening, said tape forming a bond to said coating which is stronger than the bond between said coating and said container end, whereby upon peeling of said tape from said container end, said coating delaminates from said container end in the area of the thermoplastic adhesive tape bond.

4,595,115

HIDDEN PANEL CONNECTOR

Tam H. Huynh, Huntsville, Ala., assignor to Intergraph Corporation, Huntsville, Ala.

Filed Jul. 22, 1985, Ser. No. 757,259
Int. Cl.[4] B65D *43/14, 51/04*
U.S. Cl. 220—337 **17 Claims**



14. An enclosure, comprising:

a first cover member having at least one curved member extending therefrom and curving in an upward direction, said curved member having an inside curved surface facing upward, said first cover member having a periphery with a first lip disposed thereon, and at least one first interlocking member; and

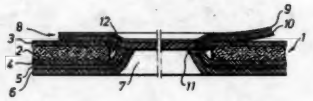
a second cover member having at least one cam member with an outside curved surface which is slideably engageable with said inside curved surface to cause said second cover member to be vertically rotatable about said first cover member, said second cover member having a periphery with a second lip disposed thereon which is engageable with said first lip, and at least one second interlocking member which is engageable with said first interlocking member when said first and second cover members are substantially closed with respect to each other.

4,595,116

OPENING ARRANGEMENT FOR PACKING CONTAINERS AND A METHOD FOR THE MANUFACTURE OF THE SAME

Lars Carlsson, Blentarp, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Mar. 6, 1985, Ser. No. 708,823
Claims priority, application Sweden, Mar. 21, 1984, 8401558
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 **10 Claims**



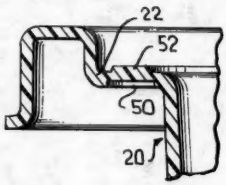
1. An opening arrangement for packing containers of the type for containing liquids, said containers formed from a laminate comprising a layer of fibrous carrier material with first and second sides, and a layer of thermoplastic on said first and second sides, the opening arrangement defined by a pouring opening provided in the laminate with a tear-off cover strip applied over the opening, the carrier layer material provided with an edge portion facing toward the pouring opening, the edge portion covered by said thermoplastic layers, said layers joined to each other so as to define a liquid-tight seal extending around the pouring opening.

4,595,117

SEALING LIP FOR LID ON THERMOFORMED CONTAINER

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Stamford, Conn.

Filed Aug. 16, 1985, Ser. No. 766,354
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 **11 Claims**



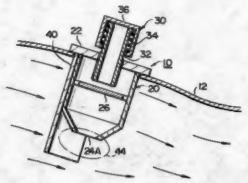
1. A container thermoformed from a plastic web, said container comprising a product receiving cavity defined by a bottom and an upstanding side wall arrangement, and a peripheral lip integrally connected to said side wall arrangement remote from said bottom and surrounding said cavity, at least the upper surface of said side wall arrangement being formed of a layer of thermoplastic resin having a porous interior due to cooling and shrinkage of the thermoplastic resin after solidification of a skin-like portion defining said upper surface, and an intermediate width portion of said lip throughout the periphery of said lip having been compressed by forging in the thickness direction of said lip to define on said lip an upstanding peripherally extending rib having an upper free sealing surface arcuately spaced from an underside of said lip.

4,595,118

AIR-BREATHER DEVICE FOR OIL CASING

Hitoshi Azuma, and Masatoshi Niimi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 23, 1985, Ser. No. 778,962
Claims priority, application Japan, Oct. 31, 1984, 59-164897[U]
Int. Cl.[4] B65D *41/04*
U.S. Cl. 220—374 **6 Claims**



1. An air-breather device for an oil casing filled with oil and accommodating a driving mechanism such as a gear means, said air-breather device comprising:

a cylindrical breather plug deflector attached to a wall of

said oil casing and having an end opening into said oil casing;

a breather plug having an open end opening into said breather plug in said oil casing and the other open end opening to the outside of said oil casing, said other open end being normally closed by a cover which is biased in the closing direction by a spring means; and

a baffle plate attached to said breather plug deflector on the upstream side of said breather plug deflector as viewed in the direction of flow of said oil such as to intercept the flow of oil which tends to flow into the opening of said end of said breather plug deflector within said casing.

4,595,119

WATER PROOF PAPER CANISTER

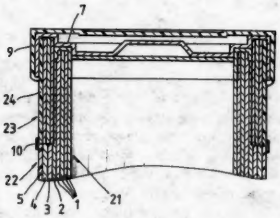
Choong M. Cho, #803, 23 Dong, Hanyang Apartment San 2 - 21, Apkujungdong, Kangnam-Ku, Seoul, Rep. of Korea

Filed Jun. 13, 1985, Ser. No. 744,416

Claims priority, application Rep. of Korea, Jun. 22, 1984, 84-5894; Mar. 28, 1985, 85-3288

Int. Cl.⁴ B65D *90/04*

U.S. Cl. 220—450 **2 Claims**



1. In sylindical tubular cask which thick paper is rolled up and adhered in many fold, water proof paper canister comprising asphalt coated thick paper which is rolled up and adhered on around the surface of said sylindical tubular cask, aluminium foil and asphalt coated thick paper are rolled up and adhered on around the surface of it again, polyester film laminated with heat sealable synthetic plastic on both side of it is rolled up and adhered with heat and press on around the surface of the asphalt coated thick paper, steel caps are inserted to the bottom of canister and to the top of lid respectively, wearing the synthetic plastic caps on these steel caps, and the end of the plastic caps are sealed with heat and press to the circumference of the body of canister and lid respectively.

4,595,120

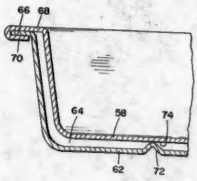
INSULATED COOKING UTENSIL

Eugene T. Logan, 2404 Parkwood Cir., Claremore, Okla. 74017, and Richard A. Barlow, 949 Marymount Rd., Salina, Kans. 67401

Division of Ser. No. 425,435, Sep. 28, 1982. This application Oct. 5, 1984, Ser. No. 658,228

Int. Cl.⁴ B65D *25/18*

U.S. Cl. 220—469 **6 Claims**



2. Insulated cooking utensil means comprising first and second cooking surfaces disposed in mutually spaced relationship, an air chamber interposed between the first and second cooking surfaces for insulating one of said surfaces from direct heat during a cooking operation, and means interposed between the first and second cooking surfaces for supporting thereof in said spaced relationship and to maintain said spaced relationship, said last mentioned means comprising a plurality of spaced detents provided in one of the cooking surfaces for engagement with the other of the cooking surfaces whereby the air is maintained in the air chamber at all times during the cooking operation; and further including peripheral means cooperating between the first and second cooking surfaces for securing said cooking surfaces together in said spaced relationship, the peripheral means including an outwardly extending planar flange member provided around the outer periphery of one of the cooking surfaces, and reverse-bend flange means provided around the outer periphery of the other of the cooking surfaces for permanent intimate securing engagement with the planar flange member.

4,595,121

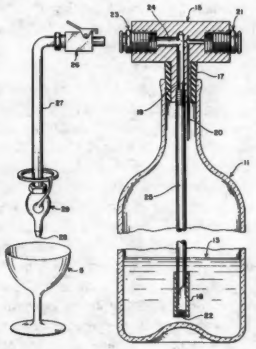
APPARATUS AND METHOD FOR DISPENSING AND PRESERVING BOTTLED DEGRADABLE LIQUIDS SUCH AS WINE AND THE LIKE

Sheldon Schultz, 8415 Sugarman Dr., La Jolla, Calif. 92037

Continuation of Ser. No. 649,153, Sep. 10, 1984, abandoned, which is a continuation of Ser. No. 563,000, Dec. 16, 1983, abandoned, which is a continuation of Ser. No. 275,550, Jun. 19, 1981, abandoned, which is a continuation of Ser. No. 49,191, Jun. 18, 1979, abandoned. This application May 22, 1985, Ser. No. 737,562

Int. Cl.⁴ B65D *83/14*

U.S. Cl. 222—1 **16 Claims**



1. Apparatus for preventing spoilage of a degradable beverage during dispensing of the beverage from a glass bottle and during storage of the beverage in the bottle between dispensing events, comprising:

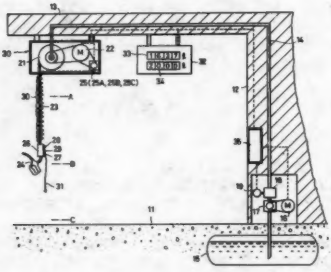
elastic balloon means for being filled with a non-degrading gas when said balloon means is not attached to said bottle in preparation for dispensing of said beverage, for attaching to said bottle to supply dispensing pressure during dispensing of said beverage, and for detaching from said bottle for storage of said bottle, said balloon means selected such that it will burst if said gas has a pressure that is above a preselected safe dispensing pressure for said bottle; and

dispensing means for controllably dispensing the beverage from said bottle under the influence of said gas in said balloon means.

4,595,122
FUEL SUPPLYING SYSTEM FOR A FUEL SUPPLYING APPARATUS HAVING A PRESET FUEL SUPPLYING CAPABILITY

Takeomi Yoshida, Fujisawa, and Kazuhisa Yamashita, Kawasaki, both of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Nov. 19, 1984, Ser. No. 673,191
Claims priority, application Japan, Nov. 22, 1983, 58-220126
Int. Cl.[4] B67D *5/30*
U.S. Cl. 222—14 6 Claims



1. A fuel supplying system for a fuel supplying apparatus which comprises a fuel supplying nozzle provided on a tip end of a fuel supplying hose, said fuel supplying nozzle having a valve, a pump for supplying a fuel to said fuel supplying hose, a flowmeter for measuring a flow quantity of the fuel which is supplied by said pump and for producing a flow quantity signal in correspondence with a supplied quantity of fuel which is measured, an indicator for indicating a supplied quantity of fuel based on the flow quantity signal from said flowmeter, a preset switch for presetting a preset fuel supplying quantity when carrying out a preset fuel supplying operation, and fuel supply stopping means for stopping the supply of fuel when the quantity of supplied fuel reaches the preset fuel supplying quantity, said fuel supplying system comprising:

previous mode storing means for discriminating whether a previous fuel supplying operation is carried out in a normal fuel supplying mode or a preset fuel supplying mode which is determined by a manipulation of said preset switch, and for storing a discriminated fuel supplying mode of the previous fuel supplying operation;

present mode storing means for discriminating whether a present fuel supplying operation is carried out in the normal fuel supplying mode or the preset fuel supplying mode, and for storing a discriminated fuel supplying mode of the present fuel supplying operation;

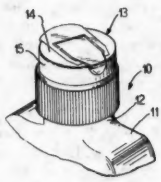
correcting quantity storing means for counting the flow quantity signal generated from said flowmeter when the fuel flows through said flowmeter so as to fill said fuel supplying hose before the valve of said fuel supplying nozzle is opened upon starting of the present fuel supplying operation, and for storing a counted value as a correcting quantity; and

quantity correcting means for reading out the correcting quantity stored in said correcting quantity storing means depending on the previous fuel supplying mode and the present fuel supplying mode which are stored in the respective mode storing means, and for correcting a fuel supplying quantity of the present fuel supplying operation according to the previous fuel supplying mode.

4,595,123
TAMPER EVIDENT CLOSURE CAP

Sidney M. Libit, Glencoe, Ill., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 17, 1983, Ser. No. 505,346
Int. Cl.[4] B65L *41/32*
U.S. Cl. 222—23 22 Claims

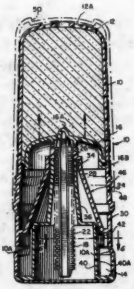


1. A tamper resistant container cap structure comprising a container cap including a top having a top surface with a socket formed therein, said surface having a dispensing orifice therethrough, said socket spaced from said orifice, a stopper for said dispensing orifice formed on the undersurface of a pivotable member, said pivotable member extending into and pivotably received in said socket to allow pivotable movement of said stopper from an orifice closed position to an orifice opened position, a flange member integrally molded with said stopper, said flange member having a portion thereof extending over and engaging a portion of said top surface on a side of said socket opposite the orifice, movement of said stopper from said orifice closed position to said orifice opened position being resisted by the engagement of said flange member with said top surface, means for quick removability of said flange member from said stopper, removal of said flange member from said stopper providing an indication of tampering with said closure, and removal of said flange member from said stopper causing complete severance of said flange member from said stopper and said cap for discarding of said removed flange member.

4,595,124
SEMI-SOLID CYLINDRICAL CONTAINER AND DISPENSER

Ernest H. Duval, Winthrop, and Louis V. Nigro, Saugus, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Mar. 29, 1985, Ser. No. 717,962
Int. Cl.[4] B67D *5/32*
U.S. Cl. 222—39 6 Claims



1. A container for dispensing semi-solid products comprising:

a first cylindrical body having a rounded closed applicator end and an opposite open ended base, said body having product discharge openings through said rounded closed end,

the major portion of said body forming a product storage chamber for a viscous semi-solid product to be dispensed,

a dome shaped product discharge piston movable through said body beneath said storage chamber,

a piston drive screw having two flat and two arcuate sides opposed each other for driving said piston upwardly in said cylindrical body to discharge the product to be dispensed through said product discharge openings,

dial and screw drive ratchet means positioned within said container having a manually rotatable cylindrical apron for advancing the screw shaft and piston positioned beneath said piston,

a base and wrench means positioned at the open end of said container positioning and supporting said dial and screw drive ratchet means to permit the drive screw to be rotated by the dial apron on said dial and screw drive ratchet means while permitting axial motion of said drive screw through said base and wrench means to drive the piston upwardly, said base and wrench means carrying a cylindrical wall defining a sound chamber having vertically disposed ribs exteriorly thereof, and

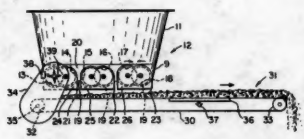
metering means for regulating the amount of contents to be discharged by upward motion of said piston comprising a pawl clicker carried by the dial apron on said dial and screw ratchet means positioned to strike the vertical ribs on the wall defining said sound chamber means on said base and wrench means to cause an audible click to sound on passage of the pawl over a rib while advancing the drive screw to move the piston upwardly and signal discharge of a metered quantity of the semi-solid contents through the discharge openings in the rounded closed end of the container.

4,595,125

APPARATUS AND METHOD FOR DISPENSING A PREDETERMINED WEIGHT PER UNIT OF TIME OF NONFREE-FLOWING PARTICULATE MATERIAL

S. Tomas Alwerud, 8031 La Jolla Scenic Dr., La Jolla, Calif. 92037

Filed Oct. 28, 1983, Ser. No. 546,396
Int. Cl.[4] G01G *11/12*
U.S. Cl. 222—55 **20 Claims**



2. In combination, a feeder capable of continuously discharging directly from a bulk storage bin or silo a predetermined constant volume per unit time of nonfree-flowing material; a continuous weigh scale having a conveyor positioned to receive material discharged by said feeder; and variable speed drive means for driving said feeder and conveyor at predetermined relative speeds, said drive means comprising an interconnection between said feeder and conveyor which maintains the speed ratio therebetween substantially constant irrespective of the speed at which they are driven by the drive means.

4,595,126

PORTABLE WATER CONTAINER WITH EASILY-REPLACEABLE LINER

William A. Holmes, 209 Highland Ave., Piedmont, Calif. 94611

Filed Aug. 23, 1982, Ser. No. 410,420
Int. Cl.[4] B65D *37/00;* A45F *3/20;* F16L *5/00*
U.S. Cl. 222—105 **19 Claims**

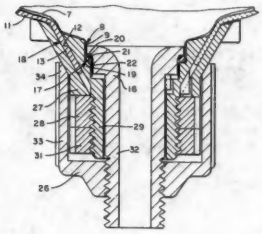
1. A portable water container comprising:

an inner bag formed of a flexible water-impermeable sheet having an opening in a first wall portion thereof;

an outer protective covering for said bag formed of a wear-resistant fabric and mounted in surrounding relation to said inner bag and having an opening in a second wall portion thereof which registers with said first-named opening;

a tubular drain and fill conduit mounted in said first-named opening; said tubular conduit comprising an annular shoulder mounted interiorly of said first wall portion;

clamp means releasably clamping said first wall portion in a watertight sealed connection to said conduit for sealing said conduit to and in flow communication with said bag; and



securement means securing said second wall portion to said conduit and providing a load-bearing attachment of said conduit to said covering, said securement means comprising:

a first annular member being mounted in engagement with the interior side of said second wall portion,

a second annular member surrounding said first annular member and being mounted in engagement with the exterior side of said second wall portion, and

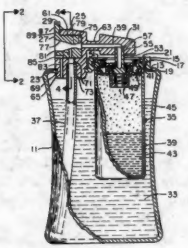
a nut threaded onto said first annular member and bearing on said second annular member for displacement thereof so as to clamp said second wall portion between said first and second annular members.

4,595,127

SELF-CONTAINED FLUID PUMP AEROSOL DISPENSER

William R. Stoody, 8659 Summerdale Rd., San Diego, Calif. 92126

Filed May 21, 1984, Ser. No. 612,131
Int. Cl.[4] B67D *5/52, 5/60, 1/08;* B05B *15/02*
U.S. Cl. 222—135 **19 Claims**



1. A self-contained fluid pump aerosol dispenser that maintains separation of fluent product from pressure regenerating fluid, which comprises:

a product fluid container integrated with a pressure vessel that contains pressure regenerating fluid and pressure vapor therefrom;

a pressure vapor discharge control valve disposed on said vessel;

and a dispensatory means mounted on the container and cooperating with said valve, having an ejector type nozzle element that ventilatingly admits ambient air into said container, and utilizes said pressure vapor to effect product effluence;

said dispensatory means having a primary structure defining passageway and within which said nozzle element is sealingly and moveably fitted;

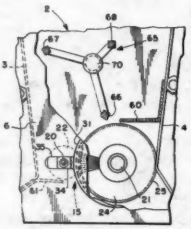
said nozzle element being alternatively positionable within said primary structure of said dispensatory means to inhibit product effluence and ambient air admittance through said dispensatory means.

4,595,128

APPARATUS FOR DISPENSING AND DISTRIBUTING MOIST, SELF-ADHERING AND COMPACTIBLE MATERIALS

Randy L. Fielding, Fremont, Ohio, assignor to Christy Machine Company, Fremont, Ohio

Filed Mar. 28, 1985, Ser. No. 717,306
Int. Cl.[4] B65D *88/54*; G01F *13/00*
U.S. Cl. 222—252 **39 Claims**



1. A dispenser apparatus comprising a material receiving hopper having a top inlet and a bottom discharge opening, a dispenser roll and dispenser roll cleaning brush mounted for rotation within said hopper adjacent said bottom discharge opening, said dispenser roll and brush being directly exposed to the material in said hopper and in closely spaced relation to each other, said dispenser roll having a knurl-like surface in which the material in said hopper is compacted, and means for rotating said brush in a direction causing said brush to rotate toward said dispenser roll as said brush passes through the material in said hopper to aid in displacing the material in said hopper towards said dispenser roll and compacting said dispenser roll with such materisl, and for rotating said dispenser roll in a direction causing the exterior of said dispenser roll to move away from said brush as said dispenser roll passes through the material in said hopper, said brush also being operative to clean said dispenser roll of the compacted material as said dispenser roll and brush come together during such rotation.

4,595,129

MOISTUREPROOF SEALING OF A CONTAINER

Eiichi Okuno, Tochigi; Naomi Okamura; Keiji Ozawa, both of Sohwa, and Takashi Saitoh, Tokyo, all of Japan, assignors to Cemedine Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,429
Int. Cl.[4] B65D *81/26, 8/04*
U.S. Cl. 222—327 **13 Claims**

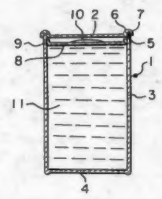
1. In a container for storing a moisture-sensitive material, which comprises:

a cylindrical member for holding said material, having a first closed end and a second closed end;

a sliding member situated in said cylinder in proximity to the first closed end;

a fillable space between said first closed end and said sliding member, said sliding member having substantially the same diameter as said cylinder and being slidable along the sides of the cylinder so as to prevent moisture-sensitive materials within said cylinder from entering the fillable space;

the improvement which comprises filling said fillable space with a volatile moisture reactive agent selected from the



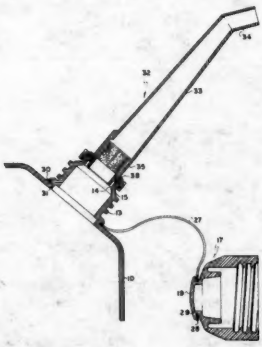
group consisting of an isocyanate, a silane, an alkyl titanate and mixtures thereof, wherein said moisture reactive agent is capable of reacting with any moisture which penetrates into said fillable space, from outside the container, form a reaction product which forms a moisture-proof film along said sliding member, capable of preventing further penetration of moisture into said cylinder.

4,595,130

REVERSIBLE POURING SPOUT ASSEMBLY FOR CONTAINERS

Sheldon Berney, Winnipeg, Canada, assignor to Reliance Products Ltd., Winnipeg, Canada

Filed Aug. 6, 1984, Ser. No. 638,358
Claims priority, application Australia, Jan. 23, 1984, PG3297
Int. Cl.[4] B65D *25/50*; B67D *3/00*
U.S. Cl. 222—539 **10 Claims**



1. The combination of a container and a revesible pouring spout assembly, said container including a substantially cylindrical pouring neck extending therefrom, said reversible pouring spout assembly being selectively movable from an extended pouring position of an internal stored position and vice versa, said spout assembly including a pouring neck attaching end and an extending pouring spout portion, means cooperating between said spout assembly and said pouring neck to detachably secure said spout assembly in sealing relationship with said pouring neck when in the extended pouring position, a closure cap detachably engaging with said neck and further independent means cooperating between said cap and said neck to detachably secure said cap to said neck for retaining said spout assembly in the internal stored position, in sealing relationship with said pouring neck and said closure cap and

also closing said container regardless of the presence of said spout assembly, said means cooperating between said spout assembly and said pouring neck as aforesaid, including said attaching end engaging over said pouring neck and camming means cooperating between the outer side of said pouring neck and the inner side of said attaching end for moving said attaching end into sealing relationship with the outer end of said pouring neck and sealing means between said attaching end and said outer end.

4,595,131

BEVERAGE DISPENSING APPARATUS

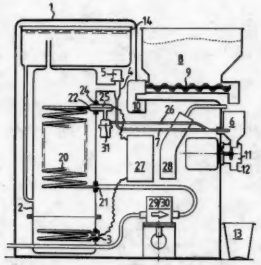
Bryan E. S. Ruskin, Eardisley, and Leonard K. Lewis, Kingswood, Nr. Kington, both of England, assignors to Equipment Services Ltd., England

Filed Feb. 10, 1984, Ser. No. 579,219

Claims priority, application United Kingdom, Feb. 17, 1983, 8304441

Int. Cl.⁴ G04C *23/00*

U.S. Cl. 222—640 **8 Claims**



1. Beverage dispensing apparatus of the kind comprising a water tank, heating means for heating water contained therein, means for storing concentrated beverage product, and means for dispensing said product in controlled, predetermined quantities, characterized by pump means for supplying a liquid ingredient for the beverage from a storage, duct means extending through said water tank to a duct outlet and connected at a duct inlet to said pump means for feeding said liquid ingredient through the water tank for indirect heat exchange therewith, temperature sensor means located adjacent the duct outlet from said water tank, temperature control means responsive to said sensor means for controlling said heating means of the water tank to adjust the water temperature and hence the outlet temperature of said liquid ingredient at the duct outlet, valve means connected to the duct outlet, and timing control means associated with said pump means for initiating flow of said liquid ingredient through said duct means and dispensing same in controlled, pre-determined quantities into a mixing chamber.

4,595,132

DEVICE FOR FRACTURING GLASS ALONG A SCORELINE

Donald Abel, Morton, Ill., assignor to Morton Glass Works, Morton, Ill.

Filed Nov. 1, 1983, Ser. No. 547,581

The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.

Int. Cl.⁴ C03B *33/04*

U.S. Cl. 225—103 **7 Claims**

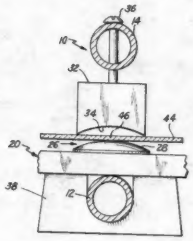
1. A device for fracturing glass along a scoreline comprising:

(a) a generally "U" shaped member having the legs of the "U" extending generally parallel to each other, the distal ends of the legs capable of being moved toward and away from each other;

(b) a glass support surface means attached to a first leg of the "U" shaped member such that it faces a second leg of the "U" shaped member;

(c) a fulcrum element attached to the support surface means and having a surface which is convexly curved in all directions from a central axis such that it makes point contact with the glass opposite the scoreline; and,

(d) a pressure block attached to the second leg of the "U" shaped member so as to be located opposite the fulcrum



element, the pressure block having a surface facing the fulcrum element which is concavely curved about a single axis oriented generally perpendicular to the central axis wherein the pressure block contacts the glass on opposite sides of the scoreline such that a force exerted on the legs of the "U" shaped member forces the pressure block toward the fulcrum element thereby causing the glass to fracture at the scoreline.

4,595,133

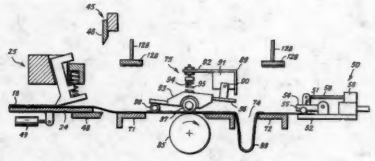
TOWEL ALIGNING, CUTTING AND HEMMING SYSTEM

Charles E. Brocklehurst, Fountain Inn, S.C., assignor to Opelika Manufacturing Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 621,935, Jun. 18, 1984. This application Jan. 10, 1985, Ser. No. 690,457

Int. Cl.⁴ B65H *23/16*

U.S. Cl. 226—34 **12 Claims**



1. A method of forming the leading edge of the plush portion of uncut toweling and the like comprising advancing the toweling along its length through a predetermined path on a work surface with the leading edge of the plush portion extending across the path, engaging the portion of the toweling opposite the work surface ahead of the edge of a plush portion of the toweling with a plurality of independently movable holding fingers with flat portions of the holding fingers flat engagement with the toweling, in response to each finger engaging the oncoming leading edge of the plush portion of the toweling tilting each finger as it engages the leading edge of the plush portion of the toweling into wedged engagement with the toweling, and retarding the movement of the toweling with the tilted holding fingers.

4,595,134

EXPLOSIVE CHARGE OPERATED DEVICE FOR DRIVING FASTENING ELEMENTS

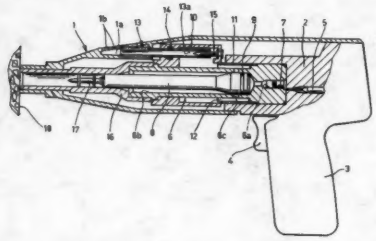
Peter Jochum, Meiningen, Austria, assignor to Hilti Aktiengesellschaft, Fevstentum, Luxembourg

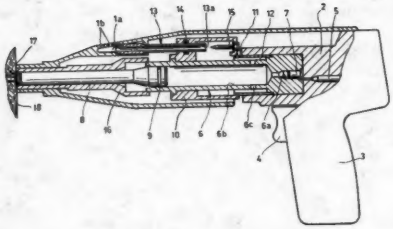
Filed Jul. 25, 1985, Ser. No. 759,079

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427616

Int. Cl.[4] B25C *1/10, 1/14*

U.S. Cl. 227—9 **9 Claims**





1. Explosive charge operated device for driving fastening elements into a receiving material comprises a housing, an axially elongated barrel axially displaceably mounted in said housing, said barrel having a first end and a second end with the driving-in direction of the fastening element being in the second end toward the first end direction, means for firing an explosive charge for supplying propellant gases in the second end of said barrel for driving a fastening element, means for conveying propellant gases from said barrel out of said housing, said barrel being axially displaceable under the action of the propellant gases when the explosive charge is fired in the direction opposite to the driving-in direction, said means for conveying propellant gases includes a throttling device comprising an axially extending passageway having a first end and a second end and a throttle member mounted in the second end of said passageway and being displaceable relative to said passageway for providing a variable throttling cross-section through said passageway when a cartridge is fired for driving a fastening element.

4,595,135

METHOD AND APPARATUS FOR FORMING HEAT EXCHANGER TUBES

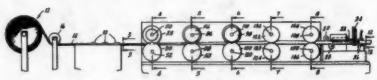
Bernard J. Wallis, 25315 Kean Ave., Dearborn, Mich. 48124

Filed Aug. 9, 1984, Ser. No. 639,131

Int. Cl.[4] B23K *31/06*

U.S. Cl. 228—17 **11 Claims**

1. In a mill for rolling flat metal strip of accurately uniform width into a tube having a pair of generally flat side walls connected along their opposite edges by rounded bight portions, the combination comprising: means at the upstream end of the mill for guiding the flat strip in an accurately straight path; a first pair of form rolls in said path downstream from and aligned with said guide means for bending the opposite longitudinal edge portions of the strip into similar upwardly curved edge portions while maintaining the portion of the strip between said edge portions in a flat condition; a second set of form rolls downstream from the first set, one roll of said second set having a peripheral V-shaped groove therein defined by a central rounded apex and opposed surfaces which flare radially outwardly from said apex and terminate in generally radially outwardly extending guide surfaces, the other roll in said second set having an axially central, radially outwardly extending annular rib with a rounded outer periphery in axial section which registers axially with the central rounded apex of said one roll and a pair of annular stop surfaces which extend axially to adjacent said guide surfaces; the axes of the rolls in the second set being spaced apart radially such that, when the strip is directed from between the first set of rolls to between the second set of rolls, the upwardly curved edge portions are engaged on the laterally outer sides thereof by said guide surfaces, the free edges of said curved surfaces are engaged by said stop surfaces and the central portion of the strip is engaged between said annular rib and the rounded apex to



bend the strip transversely into a V-shaped cross section having a central rounded apex and upwardly oppositely inclined flat legs each terminating in laterally inwardly curved rounded portions, one or more additional sets of form rolls shaped to increase the circumferential extent of the rounded apex on the strip and decrease the included angle between said legs to an extent such that the free edges of said curved edge portions are displaced toward each other into close proximity in opposed relation, the last set of said additional form rolls being shaped such as to leave said free edges spaced apart slightly, and means downstream from said additional rolls for integrally joining said free edges together to form the finished tube, said last-mentioned means comprising means for heating said edge portions to fusion temperature and a pair of squeeze rolls arranged to bear with pressure engagement against the laterally opposite edges of the formed strip, said tube mill including guide means located intermediate said last set of form rolls and said squeeze rolls, said guide means comprising a pair of channels converging in a downstream direction, each channel having a pair of side walls spaced apart such as to engage each curved edge portion of the formed strip on laterally opposite sides thereof.

4,595,136

COMBINATION TOOL FOR GAS WELDERS

Alvin J. Cooper, 500 W. King St., c/o American Wicker & Wood, Boone, N.C. 28607

Filed Oct. 11, 1984, Ser. No. 659,673

Int. Cl.[4] B23K *5/22*

U.S. Cl. 228—57 **2 Claims**

1. A compound tool for welders comprising in combination;

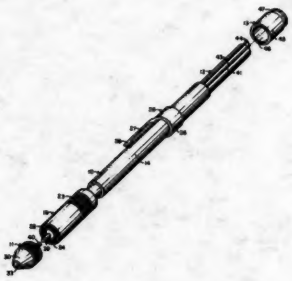
a rigid elongate tool body defining a cross sectionally smaller tip connector at its first tip end, a medial channel extending from its second cap end to a spaced distance from the first tip end and a marker channel extending through the tip end to the medial channel;

a tip, having a cylindrical body and defining an axially aligned tip connector channel with threads to engage the tip connector of the tool body, structurally communicating with a truncated conic portion defining a medial marker channel in its apex portion communicating with a medial conie chuck chamber having therein a chuck defining a marker channel therethrough and adapted to constrict to frictionally engage a marker in the marker channel as it be compressed against portion of the tip defining

the chuck chamber responsive to motion of the tip toward the body;

an elongate cylindrical cleaning wire holder defining a medial marker channel to receive a marker, having a periphery adapted to frictionally fit within the medial channel defined in the tool body, and a length slightly longer than said medial channel, said cleaning wire holder having a plurality of axially aligned grooves in the peripheral surface thereof, at least some of said grooves carrying magnetically permeable cleaning wires slightly longer than said grooves so that their ends extend therefrom and means of creating magnetic force in the wire holder to releasably bias the cleaning wires in said grooves; and

cap structure frictionally engageable upon the second cap end of said tool body to cover the medial channel defined therein.



4,595,137

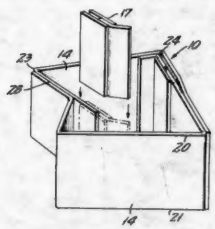
REINFORCING ELEMENT FOR COLLAPSIBLE CONTAINER

Julius B. Kupersmit, 299 W. 12th St., New York, N.Y. 10014

Filed Jun. 17, 1985, Ser. No. 745,785

Int. Cl.[4] B65D *5/58*

U.S. Cl. 229—41 R **2 Claims**



1. An improved foldable reinforcing liner for use with a collapsible reusable shipping container comprising: first and second wall elements, each of said wall elements including a side wall and first and second end walls foldably interconnected to said side wall at opposite ends thereof; said end walls, in erected position, being positioned at substantially a right angle relative to a respective side wall; said first end walls of each of said wall elements including first and second mutually foldable portions interconnected by a fold line; said second end walls of each of said wall elements being relatively rigid and being interconnected to a first end wall of the other of said wall elements only over an abutting surface of one of said first and second foldable portions, leaving the remainder of said second end walls free of interconnection and terminating in a free edge; each of said wall elements having a multiply separable member including first, second and third laminae interconnected in mutually staggered relation to define a recess; said remainder of said second end walls forming a tongue which is slidably engageable within a respective recess to effectively increase the length of said second end walls to that of said first end walls when said reinforcing liner is in use, and being removable to permit the collapsing of said liner without interference for storage.

4,595,138

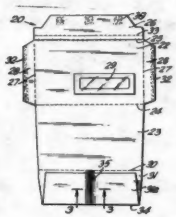
TWO-WAY ENVELOPE

Ira B. Kristel, Hewlett Harbor, N.Y., assignor to 21st Century Envelope Co., Inc., Deer Park, N.Y.

Continuation of Ser. No. 496,462, May 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 286,281, Jul. 23, 1981, abandoned. This application Jan. 28, 1985, Ser. No. 695,736

Int. Cl.[4] B65D *27/06*

U.S. Cl. 229—73 **33 Claims**



1. An envelope for multiple mailing comprising a first panel having side, top and bottom borders and having inner and outer surfaces, a second panel having side, top and bottom borders and having inner and outer surfaces, said first and second panels joined together in overlying relationship along their side and bottom borders, a first sealing flap joined to said top border of said first panel and foldable overlying a portion of the outer surface of said second panel for joining the top borders of said first and second panels during a first mailing of said envelope, a second sealing flap joined to said top border of said second panel and foldable into a first position between the inner surfaces of said first and second panels and a second position overlying a portion of the outer surfaces of said first panel for joining the top borders of said first and second panels during a second mailing of said envelope, and displacing means comprising a deformed portion of said second sealing flap arranged at an angle to the top border of said second panel for displacing a lower portion of said second sealing flap away from the inner surface of said second panel to facilitate engagement of said lower portion of said second sealing flap when folding said second sealing flap from said first position into said second position.

4,595,139

CONTROL FOR HUMIDIFIER OF THE TYPE USED WITH THERMOSTATICALLY CONTROLLED FURNACE

Michael R. Levine, Ann Arbor, Mich.

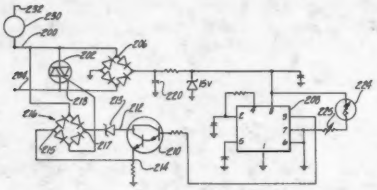
Filed Nov. 13, 1984, Ser. No. 670,166

Int. Cl.[4] B01F *3/02*

U.S. Cl. 236—44 R **11 Claims**

1. A control for use with a humidifier, capable of drawing electrical power from an electrical power source, adapted to be coupled to a hot-air furnace controlled by a thermostat so that moisture is added to heated air leaving said furnace at such time as said humidifier is energized, said thermostat controlling energization of said furnace and providing relatively short furnace operation cycles in warm weather and relatively longer furnace operation cycles in colder weather, said control

being connected to said humidifier and to said electrical power source for said humidifier to energize said humidifier for a



predetermined continuous period of time within said furnace operation cycle.

4,595,140

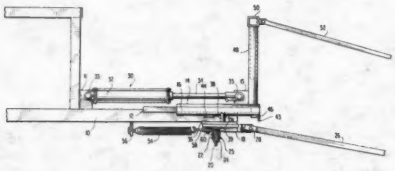
BOOM MOUNTING AND CONTROL ASSEMBLY

Russell J. Harden, and Jerrell W. Harden, both of Banks, Ala., assignors to Allied Products Corporation, Chicago, Ill.

Filed Apr. 26, 1984, Ser. No. 604,014

Int. Cl.[4] B05B *1/20*

U.S. Cl. 239—167 **35 Claims**



8. Apparatus for controlling the orientation of a boom assembly, comprising:

a frame assembly adapted to be mounted to a vehicle;

movable means coupled to said frame assembly for movement along and pivotally relative to said frame assembly;

a boom coupled to said movable means; and

single drive means coupled to said movable means for controlling movement of said movable means along said frame assembly among a first, end position, a second, intermediate position, and a third, end position spaced from said first position;

wherein, when said movable means is moved by said drive means between said first and second positions, said boom is caused to pivot in a first direction, and when said movable means is moved by said drive means between said second and third positions, said movable means causes said boom to move in a second direction substantially perpendicular to said first direction.

4,595,141

DRIVE NOZZLE ASSEMBLY FOR A REACTION DRIVE SPRINKLER

Michael Cherundolo, Upland, and Charles A. McMillen, Alta Loma, both of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Mar. 22, 1985, Ser. No. 714,994

Int. Cl.[4] B05B *3/08*

U.S. Cl. 239—230 **16 Claims**

10. A rotatable water sprinkler, comprising:

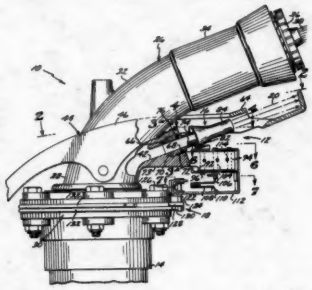
a range tube for receiving water from a water supply pipe and for discharge of the water in the form of two water streams projected generally in an outward direction with respect to the supply pipe;

means for mounting said range tube to the water supply pipe for rotation with respect thereto and for receiving water therefrom;

a drive nozzle mounted on said range tube for discharge passage of one of said water streams;

drive means pivoted with respect ot said range tube and including oppositely oriented deflector spoons for respective interruption of said one stream for driving said range tube respectively in forward and reverse rotational directions about the water supply pipe;

diverter means generally between said drive nozzle and said deflector spoons and movable between a forward-drive



position diverting said one stream for interruption by one of said spoons and a reverse-drive position diverting said one stream for interruption by the other of said spoons, said diverter means including means for preventing stalling of said diverter means in a neutral position centered generally between said forward- and reverse-drive positions; and

a reversing mechanism for moving said diverter means between said forward- and reverse-drive positions.

4,595,142

BLOWER/SPRAY DEVICE

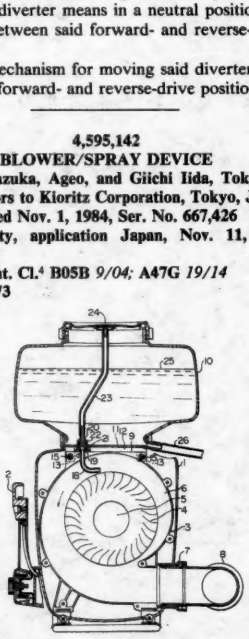
Yukio Kawaharazuka, Ageo, and Giichi Iida, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Nov. 1, 1984, Ser. No. 667,426

Claims priority, application Japan, Nov. 11, 1983, 58-174620[U]

Int. Cl.[4] B05B *9/04*; A47G *19/14*

U.S. Cl. 239—373 **3 Claims**



1. A blower/spray device comprising:

a mainbody;

a blower located in the main body;

a liquid tank located on an upper surface of said main body for containing a liquid chemical agent to be sprayed in atomized particles; and

air extracting means for extracting air from said blower and feeding same to an open space in an upper portion of said liquid tank to pressurize the liquid chemical agent contained in said liquid tank;

wherein the improvement comprises:

mounting means for removably mounting said liquid tank on the upper surface of the main body; and

a grip member mounted on the upper surface of the main body by said mounting means after the liquid tank has been removed, to enable the operator to grasp the blower/spray device and move same from one place to another; and

wherein the improvement further resides in that said air extracting means comprises:

an air extracting line secured to the main body having an inlet end located in a high pressure chamber of said blower and an outlet end opening at the upper surface of the main body on which the liquid tank is located and closed by said grip member when the liquid tank is removed from the main body and the grip member is mounted on the upper surface of the main body;

a tubular air introducing member secured to a bottom wall of said liquid tank in a position in which an outer end of said tubular air introducing member is maintained in alignment and communication with the outlet end of said air extracting line;

seal means interposed between the outlet end of the air extracting line and the outer end of the tubular air introducing member; and

an air line secured at one end thereof to an inner end of the tubular air introducing member and extending upwardly through the liquid tank until it opens at an opposite end in an open space formed in an upper portion of the liquid tank.

4,595,143

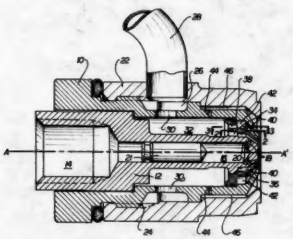
AIR SWIRL NOZZLE

Harold C. Simmons, Richmond Hts., and Curtis F. Harding, Parma, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jul. 20, 1983, Ser. No. 516,006

Int. Cl.[4] B05B *7/10*

U.S. Cl. 239—406 **14 Claims**



1. A nozzle comprising:

a housing

a nozzle body engaging said housing and cooperating therewith to form an air chamber, an air inlet to said air chamber, said nozzle body having a fuel inlet, at least one fuel chamber and at least one fuel outlet orifice that communicates with the fuel chamber through a fuel passageway, said fuel passageway being substantially aligned on an axis that intersects a longitudinal center axis of the body;

a swirl cone that is located between said housing and said body, said swirl cone cooperating with said body to form an inner annulus with said at least one fuel orifice included therein, said swirl cone also cooperating with said housing to form an outer annulus, said inner and outer annuli communicating with said air chamber, said inner annulus terminating in an inner annular outlet, said outer annulus terminating in an outer annular outlet; and

a plurality of vanes that are connected to said body and said swirl cone, said vanes being located between said air chamber and said inner annulus, said vanes being canted with respect to the longitudinal center axis of said nozzle body.

4,595,144

INJECTION DEVICE, MORE PARTICULARLY FOR DIRECT-INJECTION DIESEL ENGINES

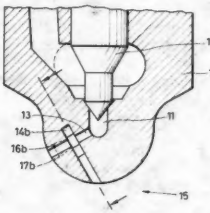
Herbert Wiegand, Cologne, and Klaus Bäumer, Bonn, both of Fed. Rep. of Germany, assignors to Deutsche-Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,283

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241679

Int. Cl.[4] F02M *39/00*

U.S. Cl. 239—533.3 **14 Claims**



1. An injection device for fuel injection more particularly for direct-injection diesel engines, comprising:

a multi-hole nozzle in which the nozzle injection channels are at an angle to the nozzle axis, wherein the suction action of the fuel jet is used to continuously draw in air through a plurality of suction slots provided for each injection channel, said suction slots ending in the narrowest cross-section of each injection channel, during the injection process and, by mixing air with the fuel all the way to the end of the injection channel, a two-phase flow of air admixed with fuel is produced, said two-phase flow penetrating the combustion chamber of the engine; and

the suction slots for at least one individual injection channel are of a different predetermined cross-sectional size with respect to the size of the suction slots for another injection channel, whereby the strength and penetration depth of each individual injection jet of each injection channel is adjusted independently according to the predetermined size of the respective suction slots, and thus a stratification of charge is achieved in the combustion chamber.

4,595,145

AIR DISTRIBUTION APPARATUS FOR A FLUID CATALYTIC CRACKING CATALYST REGENERATOR

Roy E. Pratt, Port Neches; Thomas A. Lionetti, Houston, and John P. MacLean, Stafford, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 1, 1984, Ser. No. 655,802

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.[4] B05B *1/14;* B01J *29/38*

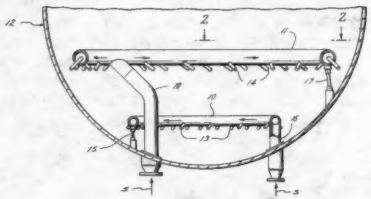
U.S. Cl. 239—558 **5 Claims**

1. An improved air distributor apparatus for delivering a high velocity oxygen-carrying gas such as air to a zone of spent catalyst in a regenerator in a fluid catalytic cracking process comprising:

(a) horizontally positioned air ring containing an air ring bore through which high velocity oxygen-carrying gas is

flowed to a plurality of nozzles; a vertical cross section of the air ring containing a geometric center of the air ring, a locus of geometric centers defining a centerline of the air ring,

(b) the plurality of nozzles (i) each nozzle of a length extending from within the air ring bore to within the zone of spent catalyst, (ii) each nozzle containing a nozzle bore of an inside diameter to allow flow of high velocity oxygen-



carrying gas from the air ring bore to the zone of spent catalyst; (iii) each nozzle positioned to direct the gas downward;

wherein the improvement comprises:

(iv) each nozzle extending from approximately the centerline of the air ring to the zone of spent catalyst; and

(v) each nozzle of length at least 4 and not more than 8 nozzle inside diameters.

4,595,146

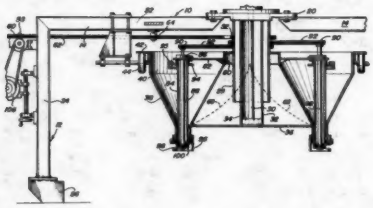
GRANULAR AND POWDERED MATERIAL FEEDER/APPLICATOR

James E. Murphy, 1921 Sherwood Dr., and Ralph F. DeTray, R.F.D. #8–Bowman Rd., both of Defiance, Ohio 43512

Filed Oct. 10, 1984, Ser. No. 659,537

Int. Cl.[4] A01C *19/00, 3/06;* **B65G** *25/00;* **B66C** *17/08*

U.S. Cl. 239—682 **11 Claims**



1. A fluent granular material dispenser including a hopper for receiving bulk quantities of fluent grandular material and including at least two laterally spaced lower outlets, dispensing means operatively associated with each of said outlets for controllably dispensing fluent material therefrom for free gravity falling onto a predetermined generally circular horizontal dispensed material receiving area disposed below said hopper, mounting means mounting said hopper for rotary movement about an upstanding axis spaed between said laterally spaced lower outlets and generally centered relative to said area.

4,595,147

SELF ATTRITION PULVERIZING MILL

Kenneth Hedges, San Pedro, Calif., assignor to Garber & Hedges Incorporated, San Pedro, Calif.

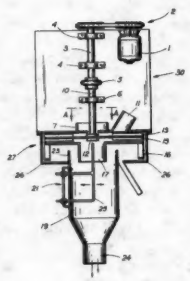
Filed Mar. 12, 1984, Ser. No. 588,546

Claims priority, application Australia, Mar. 10, 1983, PF8376

Int. Cl.[4] B02C *13/09*

U.S. Cl. 241—55 **4 Claims**

1. A pulverizing mill comprising a hollow housing into which granular material to be milled is delivered, a vertical drive shaft, a rotor assembly rotatable within said housing adapted to engage said material so as to reduce the granular size thereof, and wherein said rotor assembly comprises a driven shaft which is generally vertically extending and drivingly connected to said drive shaft by a flexible coupling to allow relative misalignment of the shafts, a plurality of angularly spaced slinger blades extending radially from said driven shaft, said blades being adapted to engage said material upon entering said housing to propel said material radially outwardly to impact against the internal surfaces of said housing so as to cause milling of said material, a plurality of blower



blades spaced axially below said slinger blades and being adapted to cause circulation of air axially within said housing to cause said material to flow therethrough, a plurality of rotor bars located adjacent said internal surfaces and mounted on said shaft so as to rotate therewith, said bars being provided to engage particles of said granular material to cause further milling thereof, resilient bearing means supporting said rotor and allowing said rotor to rotate about its centre of gravity, said bearing means including an alignment bearing located towards the upper end of said driven shaft, and a flexible bearing spaced axially downward of said alignment bearing.

4,595,148

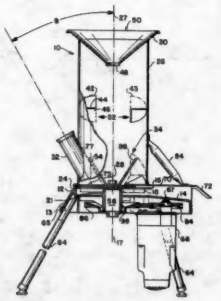
MACHINE FOR COMMINUTING WASTE MATERIAL

Adolf Luerken, Palos Verdes, and Edward J. Pilatowicz, Los Angeles, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed Oct. 3, 1983, Ser. No. 538,516

Int. Cl.[4] B02C *18/12*

U.S. Cl. 241—92 **26 Claims**



1. A machine for comminuting material comprising:

a cutter housing having a laterally-directed outlet for the discharge from the machine of comminuted material;

a cutter support plate mounted within the cutter housing for rotation about a central substantially vertical axis, said

cutter support plate provided with at least one dependent discharge blade located on the lower side of said plate;

at least one spiral deflecting vane means mounted on the cutter housing beneath said cutter support plate for cooperating with said at least one dependent discharge blade upon rotation of the cutter support plate to force comminuted waste through the laterally-directed outlet;

at least one non-radial cutting slot in the cutter support plate, a slicing cutter mounted upon the cutter support plate above each non-radial cutting slot and cooperating therewith on rotation of the cutter support plate to slice waste material and direct the comminuted waste material downwardly through the cutter support plate;

a charging container having a substantially vertical axis and walls for receiving waste material to be comminuted located over the cutter housing, the cutter support plate being positioned so as to form a base for the container;

at least one shredding blade mounted on the upper side of the cutter support plate for rotation therewith and extending upwardly and outwardly from said central substantially vertical axis into the charging container;

an inlet for light material to be comminuted located at the top of the container;

an inlet for heavy material to be comminuted comprising a downwardly inclined inlet tube passing through a lower wall of the container to discharge above the cutter support plate in the path of rotation of said at least one slicing cutter; and

a fixed counter-plate means located substantially diametrically opposite said inlet for heavy material, comprising an upper section sloping downwardly in the direction of rotation of said cutter plate and a lower section of substantially vertical orientation, said counter-plate means positioned so that the path of rotation of each slicing cutter is below and adjacent said counter-plate and so that the path of rotation of each shredding blade is above and adjacent said counter-plate, said counter-plate means cooperating with each shredding blade to produce shear action on waste material therebetween.

4,595,149

APPARATUS FOR REDUCING FIBER BALES BY WAY OF AN OPENING DEVICE

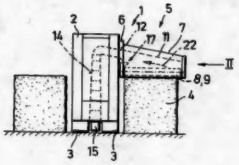
Hubert Hergeth, Kapellenweg 3, D-4408 Dülmen, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 652,776

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334222

Int. Cl.[4] B02C *23/26*

U.S. Cl. 241—101 A **6 Claims**



1. Apparatus for opening fiber bales such as bales of cotton and staple fibers by means of an opening device which includes a housing, roller means carried in said housing for opening said fiber bales by removing fibers from said bales, said roller means having a longitudinal axis about which said roller means rotates for removing said fibers and opening said fiber bales, said housing including a channel in which a suction air current is established for carrying said removed fibers away from said roller means, said housing further including an air discharge side having a suction opening through which said suction air current and fibers are discharged from said housing for conveyance for further processing, wherein the improvement comprises:

an air conducting element carried by said housing at said air discharge side and projecting into said housing above said roller means and below said suction opening at said air discharge side of said housing;

said air conducting element carried by said housing extending into said housing in a direction opposite to that direction in which said suction air current flows in said housing in a manner that the air conducting element bridges any gap created by offset bales and effectively minimizes the effects of secondary air entering said housing; and

said air conducting element having a surface which adjoins said air discharge side of said housing adjacent said suction opening.

4,595,150

BLOCKING SLAB FOR PULP GRINDER

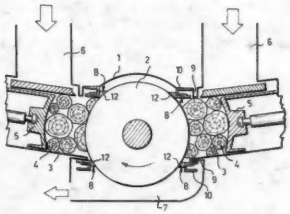
Matti Aario, Pirkkala, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Mar. 1, 1984, Ser. No. 585,105

Claims priority, application Finland, Mar. 22, 1983, 830962

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—282 **4 Claims**



1. In a pulp grinder comprising a grindstone rotably mounted in a grinding chamber, means for pressing wood to be ground against the grindstone, and a blocking slab intended to prevent escape of unground splinters and chips from between the grindstone and a wall of the grinding chamber, the improvement comprising a blocking slab in the form of a striplike frame mounted between a wall of the grinding chamber and the grindstone, said frame being parallel to the axle of said grindstone and having a longitudinal retaining edge facing the peripheral surface of said grindstone, said retaining edge being provided with at least one recess located between two longitudinal retaining ribs, said recess being substantially parallel with the axle of the pulpstone and extending the length of the pulpstone wherein said recess is formed as a groove open along the whole length of the frame.

4,595,151

BOBBIN INSERTING DEVICE

Walter Slavik, and Rudolf Luz, both of Horgen, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 611,675

Int. Cl.[4] B65H *54/02, 54/553, 54/26*

U.S. Cl. 242—18 DD **9 Claims**

1. In a yarn handling machine, the combination comprising

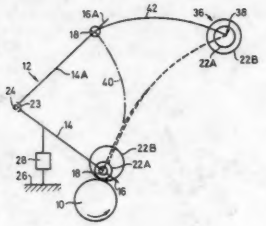
a rotatable friction drive roll;

a cradle mechanism having a pair of arms for receiving a bobbin therebetween in a yarn winding position at said drive roll;

a carrier for movement between a bobbin collection position and said yarn winding position; and

a gripper mounted on said carrier for receiving a bobbin at

said collection position and moving the gripped bobbin to said yarn winding position while imparting an axial force



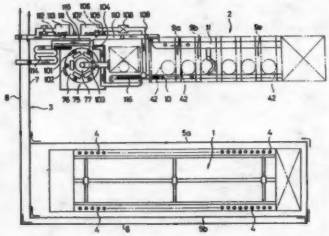
on the bobbin in said yarn winding position to press the bobbin against one of said arms of said cradle mechanism.

4,595,152

COP DELIVERY SYSTEM

Isamu Matsui; Yoshio Yamamoto, and Kazuo Nakanishi, all of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Division of Ser. No. 421,810, Sep. 23, 1982, Pat. No. 4,544,107. This application Mar. 11, 1985, Ser. No. 710,696
Claims priority, application Japan, Sep. 25, 1981, 56-152361
Int. Cl.[4] B65H *54/20, 67/06*
U.S. Cl. 242—35.5 A **3 Claims**



1. A device for automatically delivering cops from a spinning frame to a plurality of winding units and for automatically delivering empty bobbins from the winding units to the spinning frame, each cop including a bobbin having an opening extending from the bottom of the bobbin and a length of yarn wound about the outer surface of the bobbin, each winding unit including unwinding means for unwinding yarn from a cop, the spinning frame including means for winding yarn about an empty bobbin, said device comprising:

conveyor means for carrying cops from the spinning frame to the winding units and bobbins from the winding units to the spinning frame;

a plurality of cop and bobbin supporting trays for independently supporting a cop or bobbin in a vertically upright spaced apart position, the cop and bobbin supporting trays being unconnected to the conveyor means and being carried on the conveyor means so that the trays are circulated on the path of the conveyor means between the winding units and spinning frame, the cops and bobbins carried on the conveyor means being carried by a supporting tray; and

cop transfer means for automatically moving a tray carrying a cop from the conveyor means into and out of a winding position on the winder,

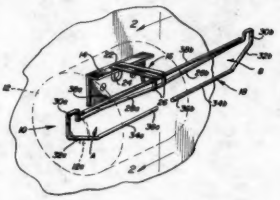
wherein the conveyor means, the cop transfer means, the spinning frame and the winding units form a closed loop.

4,595,153

PAPER ROLL HOLDER

Harold E. Goetz, 1004 First, Dodge City, Kans. 67801

Filed May 2, 1985, Ser. No. 729,952
Int. Cl.[4] B65H *16/04*
U.S. Cl. 242—55.3 **9 Claims**



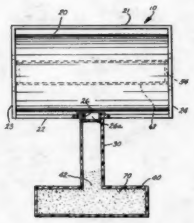
1. A holder structure for paper rolls and the like comprising and support a frame of rod-like material formed into an elongate loop having a first arm extending cantilever-wise from the support and terminating in a headed portion forming the base of the loop, a second arm extending from the headed portion back toward the support, the second arm being spaced from the first arm and terminating in a free end whereby the second arm may be resiliently flexed toward the first arm for gripping a paper roll pushed onto the frame over the head portion, and an elongate brace extending from the support at least part way along the first arm.

4,595,154

PORTABLE ROLL STOCK DISPENSER

Thomas A. Swope, 791 E. 16th St., Apt. 76, Holland, Mich. 49423

Filed Jul. 16, 1984, Ser. No. 631,396
Int. Cl.[4] B65H *19/00;* **F16M** *13/00*
U.S. Cl. 242—55.53 **17 Claims**



1. A roll stock dispenser, comprising:

a base having a hollow interior which is adapted for containing therein a ballast material;

a roll stock support housing;

means for supporting said housing above said base connected at one end to said base and at the other end to said housing;

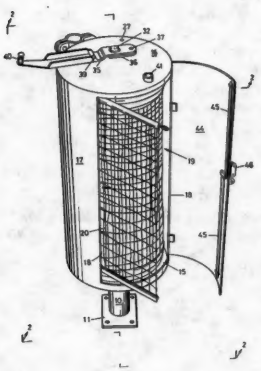
an opening in said base to facilitate filling said base with said ballast material; and

means in said support housing for supporting roll stock therein.

4,595,155
NET RETRACTOR

Stephen J. Gough, Christies Beach, Australia, assignor to John Gough, Port Noarlunga, Australia

Filed Oct. 15, 1984, Ser. No. 660,582
Int. Cl.[4] E04B *17/02*; A63B *61/04*
U.S. Cl. 242—848 6 Claims



1. A net retractor for a sporting net, comprising a base, a cover, a housing extending between the base and cover, the housing having a "C" shaped cross-sectional shape defining a net access opening,

a drum journalled for rotation within the housing, a handle external of the housing and coupled to the drum for effecting rotation thereof, a ratchet on the drum and a ratchet pawl carried by the housing and engageable with the ratchet for limiting rotation to one direction only a spring co-operatively coupling the pawl and housing urging said ratchet into engagement with said pawl, retention means carried by the housing engageable by said pawl to be effective in retaining the ratchet pawl in a release position when moved into engagement with said retention means said ratchet and ratchet pawl are contained within the housing and above the upper end of the drum,

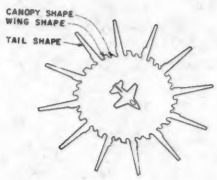
closure means on the housing positionable at least partly across the access opening, a bearing in the lower end of the housing carried by the base and a bearing in the upper end of the housing carried by the cover, said drum having a depending shaft journalled for rotation in the first said bearing and an upwardly extending shaft projecting through the cover and journalled for rotation in the second said bearing, said pawl wheel surrounding and secured with respect to the upwardly extending shaft,

and an abutment plate near the upper end of said upwardly extending shaft having an abutment surface thereon, a support plate between the abutment plate and the housing cover itself rotatable on the upwardly extending shaft, and a pivot pin joining the abutment plate to the handle, a complementary abutment surface on the handle which engages said abutment surface on the abutment plate be pivotal movement of the handle about said pivot pin upon rotation of the handle in a net retracting direction.

4,595,156
DECEPTION PATTERN FOR CAMOUFLAGE

John C. Bridenbaugh, Springboro, and Robert W. Love, Fairborn, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 20, 1984, Ser. No. 622,379
Int. Cl.[4] B64F *1/00*
U.S. Cl. 244—1 R 13 Claims



2. The method of producing a deception pattern, using a unit which is the object intended for concealment or a facsimile thereof, comprising:

placing said unit on a flat surface;

placing a point source of light at a point which has a chosen elevation and azimuth angle, and a sufficient distance from said unit that rays of light from the point striking the unit will be substantially non-divergent, thereby creating a shadow on the flat surface which is then copied in detail;

changing at least one of said angles in a systematic manner; and

repeating said copying step for each selected angle, to produce a family of shapes that are sensitive to changes in viewing angle.

4,595,157
CONTROL SYSTEM PARTICULARLY FOR WINGLESS GUIDED AMMUNITION

Heiko Uhle, Egmating, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,430
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1982, 3231528
Int. Cl.[4] F41G *9/00*; F42B *25/24*
U.S. Cl. 244—3.22 4 Claims

1. A control system for an ammunition having a longitudinal axis and adapted to move in a flight direction, comprising:

a body having a rear curved surface and a center of gravity;

means for supplying gas in said body;

at least one nozzle mounted to said body and connected to said means for supplying gas, for generating a gas jet, said nozzle oriented so as to direct the gas jet rearwardly toward and substantially tangentially over said rear curved surface with respect to the flight direction whereby the gas jet in conjunction with the ambient air flow moving over the curved surface produces reduced pressure for controlling the flight direction, said nozzle being positioned so that a resultant force of the reduced

pressure passes approximately through the center of gravity of the body; and

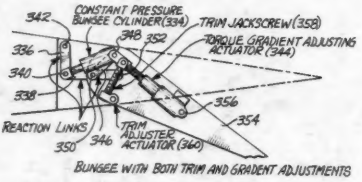
said longitudinal axis comprises an axis of rotation for said body in its flight direction, said means for supplying gas including valve means for periodically supplying gas to said at least one nozzle.

4,595,158

AIRCRAFT CONTROL SURFACE ACTUATION AND COUNTERBALANCING

Curtiss W. Robinson, Seattle, Wash., assignor to The Boeing Company, Wichita, Kans.

Filed Sep. 26, 1983, Ser. No. 536,040
Int. Cl.[4] B64C *13/36, 13/46*
U.S. Cl. 244—75 R **18 Claims**



1. In an aircraft,

a frame structure;

a flight control surface supported from the frame structure, for pivotal movement about a hinge axis, said surface being deployed against an aerodynamic load which is a function of surface deflection and imposes a torque on the flight control surface wanting to rotate it back to a neutral trimmed position;

a source of hydraulic pressure;

a counterbalancing hydraulic actuator, in the form of a single acting hydraulic cylinder which is connected to the source of hydraulic pressure by a valveless conduit means, said cylinder being connected between the frame structure and the flight control surface, and being oriented to impose a counterbalancing torque on the flight control surface acting in opposition to the torque imposed by the aerodynamic load; and

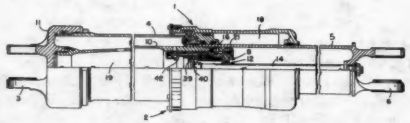
controllable separate positioning actuator means connected between the frame structure and the flight control surface for positioning the flight control surface.

4,595,159

LANDING GEAR MECHANISM INCLUDING RUNWAY-ROUGHNESS RESTRICTOR ASSEMBLY

Louis C. Hrusch, Chesterland, Ohio, assignor to Pneumo Corporation, Boston, Mass.

Filed Nov. 13, 1984, Ser. No. 670,978
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.
Int. Cl.[4] B64C *25/60*
U.S. Cl. 244—104 FP **28 Claims**



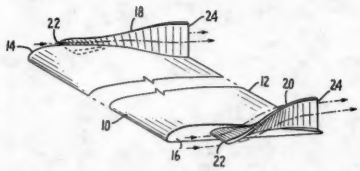
1. A landing gear mechanism for an aircraft comprising a main cylinder, a main strut piston axially movable within said main cylinder, a restrictor member contained within said cylinder and defining with said cylinder and piston upper and lower chambers, said restrictor member having a primary orifice therethrough for controlling the rate of flow of hydraulic fluid from said lower chamber to said upper chamber during landing, and bypass means providing for increased flow of hydraulic fluid from said lower chamber to said upper chamber whenever said landing gear mechanism engages a bump during taxiing to reduce the damping loads that would otherwise occur if all of such hydraulic fluid were required to flow through said primary orifice, said bypass means comprising a bypass passage around said primary orifice, a slide member mounted for axial movement relative to said restrictor member between open and closed positions for respectively opening and closing said bypass passage, and means for keeping said slide member in the closed position until after landing has taken place and a pressure equilibrium has been established in said chambers, said last-mentioned means being responsive to such pressure equilibrium being established in said chambers after landing has taken place to move said slide member to the open position.

4,595,160

WING TIP AIRFOILS

Jonathan Santos, 2902 Tapered La., Bowie, Md. 20715

Filed May 18, 1983, Ser. No. 495,804
Int. Cl.[4] B64C *5/08*
U.S. Cl. 244—199 **3 Claims**



1. An improved wing design for an aircraft, said wing having opposite ends separated from each other in a span-wise direction, with said wing generating trailing vortices at said opposite ends with the vortices turning in opposite spirals, said improvement comprising:

a pair of structural airfoils means on said opposite wing ends, with each said airfoil means having cambered surface area extending in the spiral directions of the vortices and aerodynamically coupled together with increasing dihedral angle in the flow direction, progressive changing angles of attack with respect to the chord of the wing and the leading edge of each of said airfoil means being substantially parallel to the leading edge of its respective wing so that each of said airfoils generates additional lift from the trailing vortex and simultaneously reduces the energy in the trailing vortex.

4,595,161

TUBE BUNDLE SUPPORT

George J. Williams, 36 Hickory La., Chalfont, Pa. 18914

Division of Ser. No. 499,831, Jun. 1, 1983. This application Oct. 29, 1984, Ser. No. 665,707
Int. Cl.[4] F16L *3/22*
U.S. Cl. 248—68.1 **4 Claims**

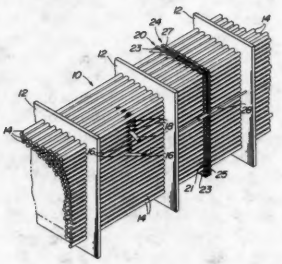
1. Supporting means in combination with tubes in a tube bundle or the like arranged in an array having a plurality of rows of parallel tubes extending between spaced apart support plates and having lanes between the rows of tubes comprising:

a plurality of first strip members extending through the lanes of the bundles to provide supporting contact for the tubes,

a plurality of second strip members extending through lanes of the bundles to provide supporting contact for the tubes,

the lanes through which the first strip members extend being transverse to the lanes through which the second strip members extend, and

frame means extending around the periphery of the array of the tube bundle in engagement with said strip members for retaining the same in place, said frame means including a first frame in engagement with the ends of said first strip members and a second frame in engagement with the ends



of said second strip members, said first strip member having slots in the ends thereof and said first frame comprising frame members extending through said slots, said second strip members having slots in the ends thereof and said second frame comprising frame members extending through said slots.

4,595,162

DEVICE FOR CLAMPING A TUBULAR MEMBER

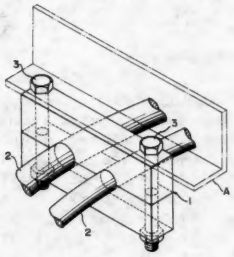
Takahiro Matsumura, Kobe, and Yoshiharu Inui, Takarazuka, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Sumitomo Gomu Kogyo Kabushiki Kaisha, both of Kobe, Japan

Filed Apr. 10, 1984, Ser. No. 598,680

Claims priority, application Japan, Apr. 15, 1983, 58-55469

Int. Cl.[4] F16L *3/22*

U.S. Cl. 248—68.1 **3 Claims**



1. A device for clamping a tubular member comprising:

a pair of gripping bodies formed of resilient material, each body being a semicylindrical body with a concentric semicylindrical recess extending along a center axis of the cylinder, said recess being used for partly receiving the tubular member,

a pair of reinforcing members formed of a harder material than that of said gripping bodies, each member being a bulged semicylinder having fillet-like side flanges integrally extending from both side edges of said bulged semicylinder radially outwardly thereof, respectively, said bulged semicylinder being concentric with said axis and having a portion of greatest radius therefrom at a midpoint taken axially of the semicylinder and portions of a smallest radius therefrom at points furthest from said midpoint in both axial directions, said reinforcing member being partly embedded in said semicylindrical gripping body in concentric relation therewith, and

means for connecting said pair of reinforcing members to each other with said tubular member clamped therebetween.

4,595,163

MOUNTING BRACKET FOR SECURING A LAMP TO A MOTOR VEHICLE

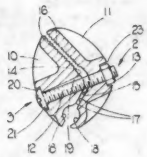
Roy S. Guggiari, Solihull, England, assignor to Butlers Ltd., Birmingham, England

Continuation of Ser. No. 598,815, Jul. 24, 1975, abandoned. This application Dec. 7, 1979, Ser. No. 101,199

Claims priority, application United Kingdom, Aug. 1, 1974, 33940/74

Int. Cl.[4] A47B *96/06*

U.S. Cl. 248—229 **5 Claims**



1. A mounting bracket for securing a lamp to a motor vehicle comprising, first and second rigid body parts, each of said body parts having a central boss of non-planar shape having mutually opposed mating surfaces, and a bore extending through each of said bosses in general alignment, screw means extending through said bores to join said body parts together, each of said body parts having lateral extensions mutually opposed to each other defining therebetween a first and a second set of clamping jaws formed respectively by first and second substantially parallel surfaces, said second set of clamping jaws being transversely recessed to accomodate a mounting bar on the lamp, said first and second sets of jaws being mutually inclined and disposed on opposite sides of said bores, the bore of said first body part being tapered from a narrow diameter at the exterior surface to a wider diameter at the interior surface of the first body part in opposition to the second body part, said screw being rotatably mounted with clearance in at least the tapered bore of said first body part, said screw and said bores in said body parts being formed such that there is less clearance between said screw and said bore in said second body part than that between said screw and said bore in said first body part, said screw and bore cooperating to permit tilting of the interior surface of the first body part with respect to the interior surface of the second body part on introduction of the mounting bar.

4,595,164

MEANS FOR REMOVABLY ANCHORING VEHICLE SEATS

Andrew Froutzis, and George Prathaftakis, both of 53224 Marina Dr., Elkhart, Ind. 46515

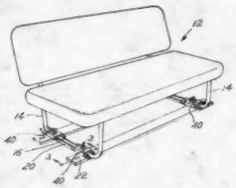
Filed Nov. 16, 1984, Ser. No. 672,896

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—429 **6 Claims**

1. A device for anchoring to the floor of a vehicle a seat having a support with a pair of horizontal lower parts comprising a pair of channels secured to the floor of a vehicle in position to receive said lower seat support parts, each channel having upper outturned marginal flanges terminating in downturned portions, a pair of anchor members carried by each fixed channel at opposite ends thereof and each having a transverse part spanning said fixed channel and having marginal hook flanges each projecting downwardly and inwardly rela-

tive to a marginal flange of said fixed channel, and an adjustment screw threaded in each transverse anchor part to bear on



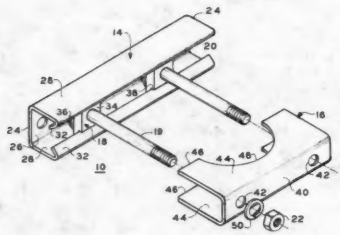
and anchor a lower seat support part and releasably interlock the hook flanges of said anchor with the flanges of said fixed channel.

4,595,165

ADJUSTABLE ANCHORING ASSEMBLY

James D. Klingensmith, Apollo, and Lyle W. Hovland, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 24, 1984, Ser. No. 680,947
Int. Cl.[4] A01K *97/10*
U.S. Cl. 248—539 **9 Claims**



1. An adjustable assembly for anchoring a cylindrically-shaped member subject to bending and torsional movement, said assembly comprising:

(a) a bar having a back portion, said back portion defining holes through which bolts or lag screws may be inserted to secure said bar to a rigid structure, said back portion integrally adjoining opposing, parallel sides which extend a predetermined depth out from the lengthwise edges of the back portion, each of said sides terminating in integral lips, said lips being directed inwardly towards the opposing side, said lips also defining a front opening area which is parallel to and opposing said back portion, said back portion, sides and lips defining an interior channel with side openings;

(b) two nuts disposed in the internal channel, said nuts being insertable into said channel through either side opening of said bar and slidable within the channel from side opening to the other side opening, said slidability enabling the nuts to be located by an installer at positions in the channel which facilitate precise positioning or alignment of the cylindrically-shaped member, each of said nuts also having a face and being sized and configured to be resistant to rotational movement about its face's axis in at least one direction when the face of the nut is parallel to the plane of the bar's back portion and facing the bar's front opening area;

(c) a clamp half having a base portion defining two bolt holes, the first bolt hole being adjacent to one end of the base portion and the second bolt hole being adjacent to the other end of the base portion, said clamp half also having two opposing planar and parallel sides extending out from the lengthwise edges of the base portion at right angles with respect to said base portion, said sides terminating in a fashion that defines an exposed edge having an arcuate portion which is sized to mate with a portion of the external surface of said cylindrically-shaped member to restrict torsional movement of said member within said arcuate portion; and

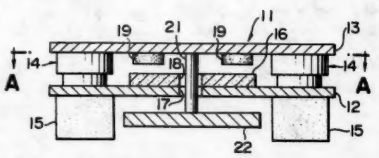
(d) means for tightly securing said clamp, cylindrical member and bar together, said means including a first and second bolt, said first bolt having one end capable of being inserted through said first bolt hole and tightly affixed to said clamp half, said first bolt having another end capable of being tightly affixed to one of the nuts disposed in said channel, said second bolt also having one end capable of being inserted through said second bolt hole and tightly affixed to said clamp half, said second bolt also having another end capable of being tightly affixed to the other nut disposed in said channel, said nuts being spaced apart a distance at least equal to the cylinder member's outside diameter, the ends of said bolts being capable of being tightly affixed such that when so tightened (1) the cylinder member contacts the opposing lip areas of the bar located between the nuts, and (2) both arcuate edge portions of said clamp tightly engage the external surface of said cylinder member to restrict torsional movement of the cylinder member relative to said arcuate portions.

4,595,166

VIBRATION ISOLATING TABLE DEVICE

Masahito Kurokawa, Yokohama, Japan, assignor to San-Ai Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 757,113
Claims priority, application Japan, Mar. 19, 1985, 60-53447
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—559 **5 Claims**



1. A vibration isolating table device comprising a base plate having an upper and a lower surface, a table body having an upper and a lower surface and for supporting an object to be mounted on the upper surface thereof, a vibration isolating means provided on the upper surface of said base plate and for supporting the lower surface of said table body horizontally in a floating state, the improvement comprising:

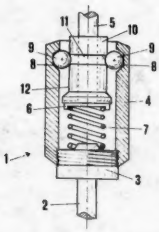
a magnetic attraction means for attracting said table body toward said base plate against a floating force of said vibration isolating means, said magnetic attraction means being provided with a magnetic plate and a magnet means respectively provided on one and the other of the upper surface of said base plate and the lower surface of said table body such that said magnetic plate and magnet means are in opposition to each other, said magnet means having a magnetic force substantially the same as the floating force of said vibration isolating means; and

means for generating a swing motion in said table body in response to an external force directly applied to said table body, said swing motion generating means being provided with a swinging member with its one end attached on the lower surface of said table body at the center portion thereof and with its longitudinal axis extending perpendicularly to the surfaces of said table body, and a weight member attached on the other end of said swinging member.

4,595,167
ANTIVIBRATION DEVICE PARTICULARLY ADAPTED FOR AN AUTOMOTIVE ENGINE SUPPORT

Giorgio Tangorra, Monza, and Edoardo Robecchi, Sesto S. Giovanni, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Apr. 5, 1984, Ser. No. 597,022
Claims priority, application Italy, Apr. 8, 1983, 20503 A/83
Int. Cl.[4] F16M *7/00*; F16F *3/08, 1/36*
U.S. Cl. 248—638 8 Claims



7. An antivibration device, particularly adapted for mounting a motorcar engine, comprising a first shaft, a first plate having one face fixed to an end of said shaft, a metallic container cylinder having (i) a lower extremity at which said first plate is fixed and (ii) an interior wall, a second shaft having a portion axially positioned within said cylinder, said second shaft for supporting the engine weight, a second plate carried at one end of said portion of said second shaft which is axially positioned within said cylinder, a tared spring interposed between said first plate and said second plate for maintaining said second shaft in a preloaded static state, a viscoelastic material rolling race disposed on a portion of said second shaft and comprising a narrowest surface portion in a middle region thereof, a metallic material sliding race comprising a circular groove in said interior wall in said metallic container cylinder, a plurality of rigid revolving elements interposed between said narrowest surface portion of said viscoelastic material rolling race and said metallic material sliding race, said revolving elements being disposed within said metallic material sliding race and said narrowest surface portion of said viscoelastic material rolling race, whereby when said second shaft is subjected to relatively small vibrations caused by said engine weight, said revolving elements remain within said narrowest surface portion of the viscoelastic material rolling race and when said second shaft is subjected to relatively great vibrations caused by said engine weight, having a magnitude which exceeds a predetermined high value, said revolving elements move out of said narrowest surface portion to a wider portion of said viscoelastic material rolling race to exert a braking force against said relatively great vibrations.

4,595,168
PLASTIC LINED PAPER FORM FOR CASTING CONCRETE COLUMNS

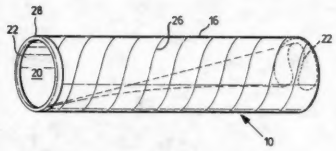
Paul Goodwin, Mississauga, Canada, assignor to Perma Tubes Ltd., Mississauga, Canada

Filed Feb. 24, 1984, Ser. No. 583,165
Claims priority, application Canada, Feb. 20, 1984, 447831
Int. Cl.[4] B28B *7/34, 7/36*
U.S. Cl. 249—48 7 Claims

1. A disposable concrete column forming apparatus for preventing the formation of undesirable form lines on the formed concrete column from forming as a result of the concrete forming apparatus and for preventing concrete column staining from water reabsorbtion back through the concrete column forming apparatus, comprising:

a rigid elongated forming tube having an inner wall surface defining an enclosure having a predetermined inside dimension and into which concrete can be poured and allowed to harden, said tube comprising spirally wound layers of paper sheet material defining undesirable spiral marking pattern and being circumferentially continuous with open opposite ends; and

a flexible self-supporting tubular liner having an outside wall surface defining a predetermined outside dimension and open opposite ends that is slidably insertable into said rigid elongated forming tube and line said inner wall surface, said flexible self-supporting tubular liner including at least one sheet of a generally rectangular impermeable plastic material closed on itself and formed into a cylinder with its lateral edges abutting and secured together on the outside thereof with a tape that seals the abutting lateral edges, said impermeable plastic liner being cooperative with said tape to prevent water seepage therethrough and

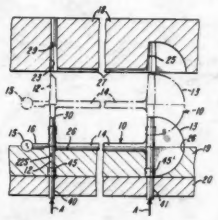


therewith prevent water reabsorbtion from staining the formed concrete column, said preselected outside dimension of said liner and said preselected inside dimension of said forming tube being so selected that the outside wall surface of the flexible self-supporting tubular liner is in a normally pressing engagement against the inner wall surface of the rigid forming means with no gap therebetween; the one sheet of plastic material having a predetermined thickness to preclude form lines forming on the hardened concrete that correspond to the spiral markings on the inner wall surface of said rigid forming means, said flexible liner being flexible between a compressed position permitting insertion of said flexible liner into the enclosure and a normally expanded position holding the flexible liner in pressing engagement against the inner wall surface of the enclosure without being bonded thereto.

4,595,169
MOLD FOR MAKING A FASTENER ASSEMBLY

Gene R. Derringer, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 654,345, Sep. 25, 1984, Pat. No. 4,554,711.
This application Aug. 1, 1985, Ser. No. 761,443
Int. Cl.[4] B29F *1/14*; B29C *1/00*
U.S. Cl. 249—67 3 Claims



1. A mold for making a one-piece fastener assembly, comprising: a mold having at least two mold portions defining a mold cavity for molding connected fasteners, with each fastener having a bar section and a button section joined by a filament section, wherein the bar sections having first and second bar portions, one mold portion having a plurality of

first cavity portions for molding first bar portions of the bar sections and another mold portion having a corresponding plurality of second cavity portions for molding second bar portions of the bar sections, the first cavity portions and the second cavity portions being generally aligned, wherein each first cavity portion has means for molding a first bar portion with a greater resistance to release than the resistance to release of the respective second bar portion from the second cavity portion, and ejector pins in the mold for the first bar portions but not for the second bar portions.

4,595,170

SOLENOID VALVE

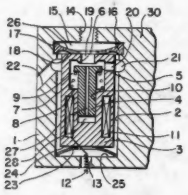
Jean Livet, Geneva, Switzerland, assignor to Honeywell Lucifer S.A., Switzerland

Filed Aug. 21, 1984, Ser. No. 642,856

Claims priority, application Switzerland, Aug. 19, 1983, 4527/83

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.05 **12 Claims**



1. A solenoid valve including a valve body, a fluid inlet conduit, a fluid outlet conduit, a seat between said conduits, a magnetic field coil, and a fluid flow damper selectively displaceable in an axial direction in a bore in the body under the effect of a magnetic field produced by an energization of the electrical coil and cooperating with the seat in the body between the fluid inlet conduit and the fluid outlet conduit provided in the body to form a fluid sealing surface, characterized by a valve housing containing the valve body, the fluid inlet conduit, the fluid outlet conduit, the seat between the conduits and the magnetic field coil and having an internal cylindrical chamber in which the valve body is housed in a displaceable manner along said axial direction; a fluid inlet pipe and a fluid outlet pipe for said cylindrical chamber; and at least one elastic joint tightly uniting the wall of the cylindrical chamber and said valve body so as to separate said inlet conduit and inlet pipe from said outlet conduit and outlet pipe.

4,595,171

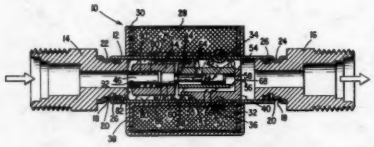
INLINE SOLENOID OPERATED VALVE

Robert J. Torrence, Addison, Ill., assignor to Controls Company of America, Schiller Park, Ill.

Filed Jul. 15, 1985, Ser. No. 754,713

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.07 **4 Claims**



1. An electrically operated fluid flow valve, comprising:

a hollow cylindrical valve sleeve;

a pair of fittings mounted one on each end of said valve sleeve for coupling the valve into a fluid flow line;

an electrical coil surrounding said valve sleeve between said fittings;

a magnetic pole piece fixedly secured within said valve sleeve inside the region defined by said coil, said pole piece having an axially aligned bore extending part way into said pole piece from one end thereof and a longitudinal exterior channel extending from the other end of said pole piece along only a portion of the length thereof and intersecting said bore;

a valve seat member press fit within said pole piece bore, said valve seat member having an axial bore therethrough open at both ends thereof, a valve seat at one end thereof, and an opening through its wall to provide communication between said valve seat member axial bore and said pole piece exterior channel;

a magnetic plunger housing slidable within said valve sleeve member into and out of contact with said one end of said pole piece, said plunger housing having an axial bore therethrough aligned with said pole piece bore and an exterior longitudinal channel;

a magnetic plunger slidable within said plunger housing bore, the end of said plunger which faces said valve seat member being configured as a valve member to cooperate with said valve seat;

first spring means for yieldably biasing said plunger housing away from said pole piece;

second spring means for yieldably biasing said plunger outward from said plunger housing bore toward said valve seat member; and

means for limiting the outward extension of said plunger from said plunger housing bore so that said valve member is out of contact with said valve seat when said coil is not energized.

4,595,172

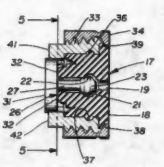
VENT VALVES FOR PROSTHETIC DEVICES

Gene Henderson, 11285 Clinton Bar Rd., Pine Grove, Calif. 95665

Filed Mar. 29, 1985, Ser. No. 717,948

Int. Cl.[4] F16K *1/38*

U.S. Cl. 251—321 **5 Claims**



1. A vent valve for mounting in a wall of a low pressure chamber comprising,

an elastomeric body mounted in sealed relation in said wall and having a passageway therethrough venting said chamber to the atmosphere, said passageway being formed with an enlarged cavity providing a valve seat facing away from said chamber;

a valve member mounted in said cavity and having a stem extending to the exterior of said body and a button on the outer end of said stem adapted for manual engagement for moving said valve member from said seat to provide a vented position for said chamber; and

biasing means including a plurality of elastomeric nodules on said elastomeric body surrounding said passageway and positioned for engagement with said button for normally positioning said valve member in sealed position in said seat, said nodules being formed for compression upon

inward displacement of said button to move said valve to said vented position.

4,595,173

CAPSTAN WINCH, PARTICULARLY FOR SAILING BOATS

Frode Anderson, Olaf Ryesvej 4, 7100 Vejle, Denmark

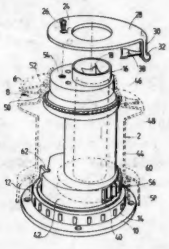
PCT No. PCT/DK83/00127, § 371 Date Aug. 23, 1984, § 102(e) Date Aug. 23, 1984, PCT Pub. No. WO84/02511, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 22, 1983, Ser. No. 645,326

Claims priority, application Denmark, Dec. 27, 1982, 5736/82

Int. Cl.[4] B66D *1/14, 1/30*

U.S. Cl. 254—342 **5 Claims**



1. A capstan winch comprising a stationary base for mounting on a mounting surface so as to project therefrom, a stationary shaft element, a winch drum mounted on the shaft element, an outer drive member cooperating with a rotatable shaft in a middle area of the winch, said rotatable shaft being disposed eccentrically relative to the winch drum and being provided with monolaterally active driving means engaging an interior area of the drum for rotating the drum, said stationary shaft element projecting axially between the drum and the rotatable shaft at a location diametrically opposite to the engagement area of said driving means and further out to the free end of the drum, where the shaft element carries a fixed radial arm projecting outwardly and downwardly about an upper disc flange on the drum into an annular rope holding groove adjacent the upper end of the drum, characterized in that the driving means between the drum and the eccentric shaft includes a pinion mounted concentrically on the rotatable shaft and engages a partial area of an interior, relatively wider toothed rim on the drum.

4,595,174

HORIZONTAL LINE GRIP DEVICE

Cleveland E. Dodge, Jr., Pownal, Vt., and Lawrence R. Stafford, Albany, N.Y., assignors to International Dodge, Inc., New York, N.Y.

Continuation of Ser. No. 544,602, Oct. 24, 1983, abandoned. This application Jun. 17, 1985, Ser. No. 745,378

Int. Cl.[4] H47L *3/04;* **A62B** *35/00;* **B65H** *59/16;* **E06C** *7/18*

U.S. Cl. 254—391 **13 Claims**

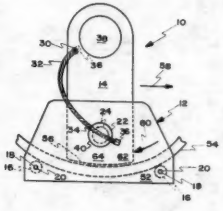
1. A grip device attaching a man to a resilient horizontal safety line comprising:

(a) U-shaped channel means adapted to be disposed around said line and defining a channel for containing said line, said channel means having a first gripping surface on the inside of said U-shaped channel;

(b) operator means defining a second gripping surface and pivotally supported within said U-shaped channel;

(c) support means for pivotally supporting said operator means so that said second gripping surface is in a spaced facing relationship with said first gripping surface, said operator means being dimensioned so that said second gripping surface will define a plurality of radii of different length when rotated about said support means so that the distance between said first gripping surface and said second gripping surface changes from a minimum to a maximum value when said operator means is rotated about said support means; and

(d) flexing means defining first and second flexing surfaces, said flexing surfaces being disposed on the side of said safety line opposite said operator means, said first flexing



surface positioned adjacent one transverse side of said operator means, and said second flexing surface being positioned adjacent the other transverse side of said operator means, so that a continuous line in contact with said first and second flexing surfaces will be springedly urged into contact with said second gripping surface and said first and second flexing surfaces, said flexing means comprising a plurality of rotating elements.

4,595,175

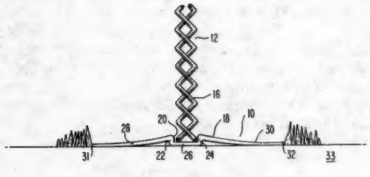
FENCELINER

Lawrence R. Kauffman, Rte. 10, Box 101, and Kenneth Kauffman, Lot 26, Horizon La., both of Gadsden, Ala. 35901

Filed Apr. 2, 1985, Ser. No. 718,971

Int. Cl.[4] E04H *17/06*

U.S. Cl. 256—1 **8 Claims**



1. A fenceliner for inhibiting the growth of grass, weeds or like vegetation beneath and closely adjacent to a fence having a plurality of posts and at least one fence panel, and for inhibiting the passage of small animals across the border defined by the fence, comprising:

a strip of flexible sheet material having a width greater than the width of the fence and a length coextensive with the length of the fence and adapted to be arranged on the ground beneath the fence;

said strip including a recess extending along the center longitudinal axis thereof, for receiving said at least one fence panel, and outwardly extending legs extending integrally from said recess symmetrically to lie beyond the opposite sides of the fence panel, for covering areas of the ground on opposite sides of the fence, said legs being substantially thicker adjacent said recess and gradually thinning at their opposite ends, for upwardly biasing said fenceliner when said recess is urged downwardly by the panel of a fence, said biasing providing for facilitated installation under an existing fence, for quick destruction of undesirable vegetation around the fence for inhibiting of the passage of small animals underneath the fence; and

a plurality of pad members for receiving the posts, said flexible strip extending over opposite ends of said pad

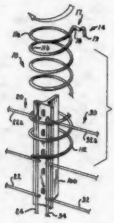
members, said pad members maintaining the continuity of said fenceliner underneath the fence adjacent the posts.

4,595,176

LATCH FOR LIVESTOCK PANELS

Charley B. Crabtree, R.R. 3, Box 74, Mt. Vernon, Mo. 65712

Filed Sep. 10, 1984, Ser. No. 648,960
Int. Cl.[4] B21F *27/00*; E04H *17/02*
U.S. Cl. 256—52 **20 Claims**



1. In combination with at least one fence panel having spaced-apart, reinforcing wire elements therein and a fence post for attachment of said at least one fence panel thereto, a fastener device comprising:

a helical rod, said rod having spaced-apart lower and upper ends and presenting a plurality of generally concentric rings therebetween allowing for passage of said post therethrough;

a user-operated handle at the upper end of said rod for rotating said rod about its imaginary axis upon insertion of an upper end of said post through a ring at the lower end of said rod, said rotation causing said rod to wind about said fence post and said wire elements of said fence panel adjacent thereto in a manner to confine portions of said wire elements within the confines of said rings and adjacent said post whereby to connect said panel to said post; and

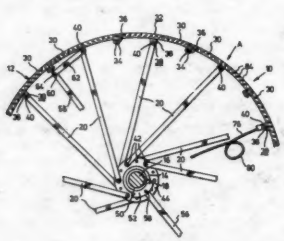
locking means associated with said handle for engagement with a wire element of said fence panel to preclude movement of said handle and rotation of said rod whereby to maintain said position of said rod connecting said fence panel to said post.

4,595,177

ROTARY DRUM

Kenneth C. W. Done, Swindon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 9, 1984, Ser. No. 658,707
Claims priority, application United Kingdom, Oct. 13, 1983, 8327444
Int. Cl.[4] B22D *11/00*
U.S. Cl. 266—248 **7 Claims**



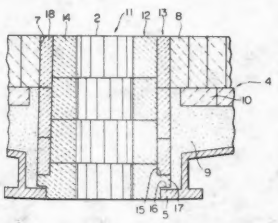
1. A rotary drum comprising a hollow cylindrical outer member, a co-axial hub member, and a plurality of spoke members each pivotally connected to the hub member and pivotally connected to the outer member, each spoke member being aligned at an oblique angle to the radius at the respective pivotal connection to the hub member, and each spoke member being inclined in the same sense relative to the radius at the respective pivotal connection, the arrangement being such that thermal expansion is accommodated by rotation of the outer member relative to the hub member.

4,595,178

LEG FOR VACUUM TANK FOR REFINING MOLTEN STEEL

Hitoshi Kato, Seto, and Eiji Kawamoto, Tajimi, both of Japan, assignors to Tokyo Yogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,634
Claims priority, application Japan, Feb. 2, 1984, 59-18070
Int. Cl.[4] C21C *7/10*
U.S. Cl. 266—280 **3 Claims**



1. A leg of the kind which is fitted through a joint material into each of a pair of vertical openings on a bottom wall of a vacuum tank for refining molten steel, for protecting the walls of said vertical openings from molten steel, said leg including an annular brick wall formed by piling with a joint material a plurality of magnesia-chrome fired radial bricks in a plurality of horizontal annular rows arranged one on the other so as to form an inner bore for passing the molten steel therethrough; wherein said leg comprises:

an annular brick wall formed of an annular inner wall forming said inner bore and an annular outer wall covering substantially the entire outer surface of said annular inner wall;

said annular inner wall is formed of a plurality of magnesia-chrome fired radial bricks piled with a joint material in a plurality of horizontal annular rows arranged one on the other so as to form said inner bore; and

said annular outer wall is formed of a plurality of magnesia-chrome fired radial bricks piled with a joint material in a plurality of horizontal rows arranged one on the other so as to cover substantially the entire outer surface of said annular inner wall, and the inner surface of said annular outer wall is in contact with the outer surface of said annular inner wall through the joint material; and

wherein said annular outer wall substantially inhibits radially outward expansion of said plurality of magnesia-chrome fired radial bricks forming said annular inner wall, the joint material of said annular inner wall being prevented from loosening over a number of refining cycles of the vacuum tank.

4,595,179
HYRAULIC DAMPING DEVICE AND ARTIFICIAL JOINT EMPLOYING THE DEVICE

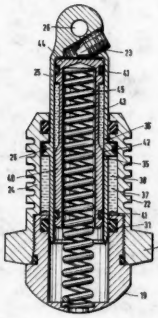
Richard Glabiszewski, Duderstadt, Fed. Rep. of Germany, assignor to Otto Bock Orthopädische Industrie, KG, Duderstadt, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 504,847

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222885

Int. Cl.[4] F16F *9/10;* **B60G** *13/00, 15/00;* **A61F** *2/72*

U.S. Cl. 267—8 R **10 Claims**



1. A hydraulic damping device, particularly for damping the movement of artificial joints, comprising a cylinder; a first hollow piston movable in said cylinder and having a jacket provided with an annular shoulder to define with the inner surface of the cylinder two annular chambers of variable volume for storing a hydraulic medium; a second hollow piston movable in said first hollow piston and having a jacket formed with an annular recess facing the inner wall of said first piston to act as an equalizing chamber; the jacket of said first hollow piston having at least two throughgoing passages provided at opposite sides of said shoulder to establish communication of respective variable volume chambers with the equalizing chamber; means for adjusting the cross section of at least one of said through passages, said adjusting means including a sloping wall portion arranged between said annular recess and the jacket of said second piston in the range of said two passages; and an axial position adjuster acting in one direction on said second piston and including a return member arranged in said second piston and acting thereon in opposite direction.

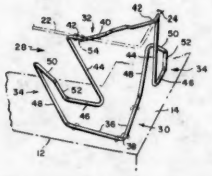
4,595,180
SPRING ASSEMBLY

Robert C. Hagemeister, Boston, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Oct. 5, 1984, Ser. No. 657,982

Int. Cl.[4] A47C *23/04*

U.S. Cl. 267—103 **5 Claims**



1. A spring assembly comprising a rigid rectangular base frame comprising spaced, parallel sides and ends, a grid frame comprising a rectangular border wire and trasnversely and longitudinally-crossing grid wires attached to the border wire at their ends and to each other at their crossing and spring means distributed in longitudinally and transversely-spaced relation between the border wire and the base frame and at corners between the border wire and the base frame, supporting said grid frame in spaced, parallel relation with the base frame and connecting the same, characterized in that the spring means at the corners comprise upper and lower attaching members and a pair of transversely-spaced side members, said transversely-spaced side members being symmetrical from side to side and asymmetrical from front to back, said upper attaching member comprising a first length of wire such as to span the border wire along the sides at the corner of the grid, second lengths of wire connected at one end to the opposite ends of the first length of wire and disposed at an oblique angle thereto such as to be parallel to the base frame at the corners of the border wire, said lower attaching member comprising integrally-connected third lengths of wire disposed at substantially right angles to each other substantially parallel to the respective sides at the corners of the base frame and said side members each comprising upper and lower legs, said upper legs being connected at their upper ends to the distal ends of the second length and extending downwardly and forwardly relative to the first length of wire more then half the distance between the grid frame and the base frame, said lower legs being connected at their lower ends to the distal ends of the third wires and extending upwardly and rearwardly relative to the third legs a distance more than half the distance between the base frame and the grid frame and means connecting the lower ends of the upper legs to the upper ends of the lower legs such that the lower ends of the upper legs are suspended forwardly of the upper ends of the lower legs so that pressure brought to bear on the upper attaching element cants the upper legs forwardly relative to the lower legs.

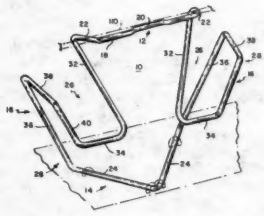
4,595,181
BENT WIRE SPRING UNIT

Robert C. Hagemeister, Boston, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Jul. 18, 1984, Ser. No. 632,047

Int. Cl.[4] F16F *3/02*

U.S. Cl. 267—103 **12 Claims**



1. A bent wire spring unit for interposition between a rigid base frame and a grid frame for attachment thereto comprising upper and lower attaching members and a pair of end members, said end members being transversely symmetrical from side to side and asymmetrical from front to back, comprising upper legs extending downwardly and forwardly from the upper attaching member and toward each other, arms connected at one end to the lower ends of the upper legs, lower extending upwardly and rearwardly from the lower attaching member and away from each other, arms connected at one end to the upper ends of the lower legs and means connecting the other ends of the arms of the respective end members to each other, said upper and lower legs being parallel to each other and said arms being parallel and at right angles to each other.

4,595,182

CONSTRUCTION ASSEMBLY

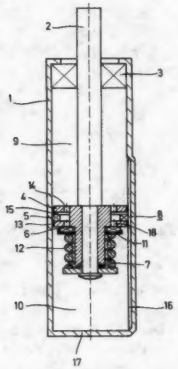
Herbert Freitag, Koblenz-Metternich, and Gerhard Reichert, Neuwied, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,370

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301544

Int. Cl.[4] F16F 5/00

U.S. Cl. 267—120 5 Claims



1. In a construction assembly comprising

(a) a basic construction unit;

(b) a flap member pivotally mounted on said basic construction unit for pivotal movement about a substantially horizontal axis through a basic path of angular movement between a first or lower angular position and a second or upper angular position;

(c) at least one gas spring pivotally connected to said basic construction unit and to said flap member for assisting movement of said flap member within said basic path of angular movement against the action of gravitational forces, said gas spring comprising

(ca) a cylinder member having a cylinder axis and being provided with a bottom wall at one end thereof and a piston rod sealing and guiding unit adjacent the other end thereof such as to define a cavity axially between said bottom wall and said sealing and guiding unit;

(cb) a piston rod extending inwardly and outwardly of said piston rod sealing and guiding unit and being sealingly guided therethrough for axial movement inwardly and outwardly of said cavity through a basic path of axial movement corresponding to said basic path of angular movement between a first or inner axial position corresponding to said first or lower angular position of said flap member and a second or outer axial position corresponding to said second or upper angular position of said flap member;

(cc) a piston unit fixed to said piston rod within said cavity and dividing said cavity into two working chambers, a first working chamber surrounding said piston rod and a second working chamber on the side of said piston unit remote from said piston rod;

(cd) a fluid path system between said first and said second working chambers;

(ce) a pressurized fluid within said cavity exerting an outwardly directed thrust onto said piston rod, said thrust being sufficient to overcome said gravitational forces acting onto said flap member at least in a partial section of said basic path of angular movement adjacent said second angular position;

the improvement including:

(d) said flap member is movable beyond said second angular position through an additional path of angular movement and said piston rod is movable beyond said second axial position through an additional path of axial movement corresponding to said additional path of angular movement, and wherein the thrust directed outwardly onto said piston rod by said pressurized fluid is sufficient to overcome said gravitational forces acting onto said flap member in said additional path of angular movement such that within this additional path of angular movement said flap arrestable along said path in each position along said path by said thrust on the one hand and the pressurized fluid in the first working chamber on the other hand;

(e) said fluid path system comprises a first fluid path responsive to the axial position of said piston rod along said cylinder axis such as to be open along said basic path of axial movement and to be closed along said additional path of axial movement;

(f) said fluid path system further comprises a second fluid path between said two working chambers with relief pressure valve means opening from said first working chamber towards said second working chamber in response to a predetermined pressure differential between a higher pressure in said first working chamber and a lower pressure in said second working chamber, said relief pressure valve means comprising a valve member closing said second fluid path under the action of a spring means, said spring means biasing said valve member towards a closed position such as to elastically throttle the flow of liquid through said second fluid path during the movement of the flap member substantially along the total additional path of angular movement under the action of an externally applied force; and

(g) said fluid path system further comprises a third fluid path between said two working chambers with direction-responsive valve means, said direction-responsive valve means opening from said second working chamber to said first working chamber in response to inwardly directed movement of said piston rod.

4,595,183

VIBRATION ISOLATING DEVICE

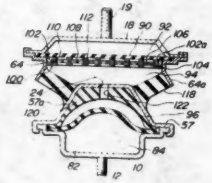
Takuya Dan; Hiroshi Kojima, and Michihiro Orikawa, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,500

Claims priority, application Japan, Mar. 9, 1983, 58-34453[U]; Apr. 13, 1983, 58-55002[U]; Jul. 13, 1983, 58-108449[U]

Int. Cl.[4] F16M 1/02; B60G 13/00

U.S. Cl. 267—140.1 5 Claims



1. A vibration isolating device comprising: first and second rigid fitting members; an elastomeric block member interposed between said first and second fitting members, a diaphragm secured to one of said fitting members; a hollow chamber mainly defined by said elastomeric block member and said diaphragm and containing a vibration-damping liquid therein; and a partition member dividing said hollow chamber into two small liquid chambers and being provided with a restricted passage such that said two small chambers communicate with each other; an auxiliary vibration-damping unit arranged inside one of said two small liquid chambers facing said elastomeric

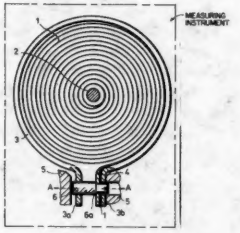
block member, said auxiliary vibration-damping unit comprising an elastic film movable in response to the pressure change inside the hallow liquid chamber, a pair of deformation-restricting members housing said elastic film therebetween, and a flexible diaphragm disposed outside one of said two deformation-restricting members and defining together with a plate member disposed outside said flexible diaphragm a closed air chamber wherein said flexible diaphragm is fixed at its peripheral end between one of said two deformation-resticting members and said plate member.

4,595,184

CONTROLLABLE SPIRAL SPRING, IN PARTICULAR WITH LOGARITHMIC CHARACTERISTICS

Nándor Böhm; János Böhm, and Róbert Böhm, all of Budapest, Hungary, assignors to Kozuti Kozlekedesi Tudomanyos Kutato Intezet, Budapest, Hungary

Filed Aug. 6, 1980, Ser. No. 175,707
Int. Cl.⁴ F16F *1/08*
U.S. Cl. 267—156 **3 Claims**



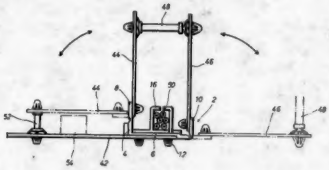
1. In a measuring instrument having a casing and a rotatable indicator shaft, and a helical spring secured at its outer end to the casing and at its inner end to the shaft; the improvement in which the cross sectional area of the spring varies progressively substantially from end to end thereof, the thickness of the spring measured radially of the shaft being substantially constant and the total width of the spring varying substantially from end to end thereof, the spring having an elongated cutout therethrough extending lengthwise of the spring, the width of the cutout varying progressively substantially from end to end thereof.

4,595,185

FIXING APPLIANCE

Hiroji Kitagawa, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Jul. 16, 1984, Ser. No. 631,312
Claims priority, application Japan, Jul. 19, 1983, 58-112023[U]
Int. Cl.⁴ H01R *13/54*
U.S. Cl. 269—43 **8 Claims**



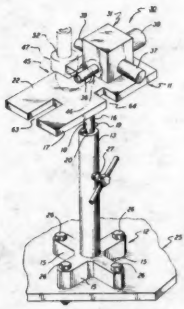
1. A fixing appliance comprising:
(a) a base plate having one end portion thereof bent toward an upper surface thereof to form an upstand portion of a predetermined height;
(b) a first substrate mounting portion for a first substrate being contiguous to a free end portion of said upstand portion and being tiltably fixed thereto via a first flexible thin-wall portion formed at said free end portion of said upstand portion;
(c) a second substrate mounting portion for a second substrate being contiguous to another end portion of said base plate and being tiltably fixed thereto via a second flexible thin-wall portion formed at said another end portion;
(d) a retaining portion provided on a lower surface of said base plate, said retaining portion having means for connecting to a fixing member;
(e) a first retaining means provided on said first substrate mounting portion and a second retaining means provided on said second substrate mounting portion, said first and second retaining means each having a connection plate extending from a respective one of said first and second substrate mounting portions and each having at least one elastic hook piece elastically deformable in a lateral direction and extending from a free end portion of a respective one of said connection plates toward one of said substrate mounting portions, and a retaining projection connected to an open end face of each said elastic hook piece respectively, whereby said first and second retaining means may expand by virtue of the elasticity thereof and retain a respective said substrate after being inserted into a fixing hole thereof.

4,595,186

ROTATING WELDING FIXTURE

Richard A. Reed, 18 Minerva St., Oswego, N.Y. 13126, and William J. Kidd, P. O. Box 219, Hannibal, N.Y. 13074

Filed Dec. 20, 1984, Ser. No. 683,924
Int. Cl.⁴ B23Q *1/04*
U.S. Cl. 269—69 **5 Claims**



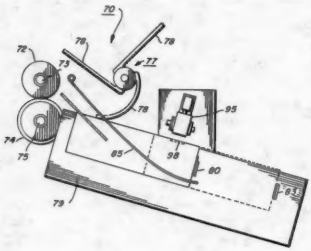
1. Apparatus for supporting a pipe fitting in a position so that the continuous socket weld can be formed between the fitting and a pipe section contained within a socket joint that includes a welding table having a planar working surface, pivot means for rotatably supporting the table within a base so that the table turns in the plane of the working surface, a block operatively associated with the table by means of an adjustable draw bar for selectively positioning the block in regard to the working surface of said table, at least one elongated clamping member outwardly disposed from said block in parallel alignment with the working surface of the table, said member being a circular dowel receivably within an opening contained in the pipe fitting to provide a running fit within said opening, and adjustable means associated with the draw bar for selectively positioning the block in regard to the table to lock the fitting between the clamping member and the working surface of said table.

4,595,187

SADDLE STAPLER ACCESSORY

Henry T. Bober, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 26, 1985, Ser. No. 760,208
Int. Cl.[4] B41L *43/12*
U.S. Cl. 270—37 **12 Claims**



1. A saddle stapler accessory for preparing booklets, comprising:

creasing rolls for applying a crease to incoming sheets;

a roof-shaped compiler tray for receiving the sheets and compiling the sheets into sets on a support surface thereof;

fold forming baffles configured in relation to said compiler tray to fold the sheets in the form of said support surface of said compiler tray;

a paddle wheel for driving the sheets into said compiler tray;

first and second registration gates for registering the sheets at predetermined positions;

control devices for guiding the sheets onto and centering the sheets on said support surface of said compiler tray; and

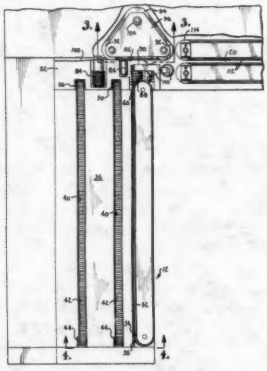
a stapler for saddle stitching the sheets as a set at said first and second registration positions.

4,595,188

ENVELOPE FEEDING SYSTEM AND SPEED CONTROL FOR MAIL SORTING MACHINES

David Wiley, Shawnee, and Roy A. Akers, Olathe, both of Kans., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 15, 1984, Ser. No. 671,598
Int. Cl.[4] B65H *1/02, 3/12*
U.S. Cl. 271—4 **27 Claims**



1. In a mail sorting machine having a magazine section for receiving a supply of envelopes to be sorted, pickoff means for picking off the envelopes one at a time from the envelope supply, multiple speed feeding means for feeding the envelope supply in said magazine section to said pickoff means, and means for sorting and depositing the envelopes in a storage area of the machine, the improvement comprising:

means for sensing the presence or absence of an envelope at a pickoff station adjacent the pickoff means;

means for automatically decreasing the speed of the feeding means when an envelope is present at said pickoff station for a first predetermined time period selected as being indicative of undue bunching of the envelopes in the magazine section of the machine; and

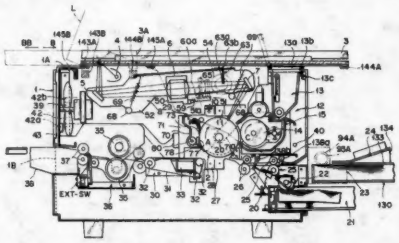
means for automatically increasing the speed of the feeding means when an envelope is absent from said pickoff station for a second predetermined time period selected as being indicative of undue looseness of the envelopes in the magazine section of the machine.

4,595,189

PAPER FEEDER APPARATUS

Yasuo Abuyama, and Toshiyuki Sogo, both of Ebina, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 21, 1982, Ser. No. 451,800
Claims priority, application Japan, Dec. 25, 1981, 56-211105; Dec. 25, 1981, 56-211106
Int. Cl.[4] B65H *3/44*
U.S. Cl. 271—9 **4 Claims**



1. A paper feed apparatus comprising:

an automatic paper feeding mechanism for automatically feeding sheets of paper when a paper-feed cassette is mounted on said apparatus;

a manual paper feeding mechanism for performing manual paper feeding through a manual guide, wherein said manual guide is detachably mounted to said paper feeder apparatus through an opening in the paper feeder apparatus, whereby said manual guide is detachable from said paper feeder apparatus as needed so that a paper-feed cassette with a manual guide can be mounted through said opening;

a paper cassette unit having a paper feed roller and a guide roller so that mounting/dismounting of a manual-guide-attached paper-feed cassette to the paper feeder apparatus can be easily performed through said paper cassette unit;

means for detecting whether or not said manual-guide-attached paper-feed cassette is mounted; and

means for selecting and operating said automatic paper feeding mechanism when a signal from said detecting means indicates that said manual-guide-attached paper-feed cassette is not mounted through said opening.

4,595,190

BOTTOM SHEET SEPARATOR-FEEDER

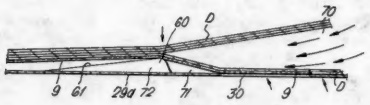
Kiri B. Amarakoon, Letchworth, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1983, Ser. No. 534,003

Claims priority, application United Kingdom, Sep. 21, 1982, 8226839

Int. Cl.[4] B65H 3/12, 3/46

U.S. Cl. 271—94 6 Claims



1. A bottom sheet separator-feeder for separating and forwarding sheet seriatim from the bottom of a stack of sheets to be fed, comprising a stack tray for supporting a stack of sheets to be fed, apertured endless vacuum feed belt means extending through at least the front end of the sheet stack tray for acquiring and advancing the bottom sheet of the stack, said belt means extending across a support surface having vacuum ports therein for applying a negative pressure at the back of and through the belt means, lip means extending across the support surface normally to the direction of movement of the feed belt means upstream of the vacuum ports to reduce or prevent air flow through the apertures in said belt means upstream of said ports.

4,595,191

PAPER FEED DEVICE HAVING RETRACTABLE SEPARATING PAWLS

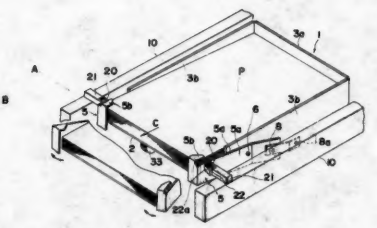
Tadamitsu Uchiyama, Yokohama; Toshihiro Hayashi, Mitaka, and Yoshinori Osamura, Machida, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 12, 1984, Ser. No. 660,318

Claims priority, application Japan, Oct. 17, 1983, 58-194595

Int. Cl.[4] B65H 3/56

U.S. Cl. 271—170 12 Claims



2. A paper feed device which is cooperable with a paper feed section of an apparatus body, said paper feed device comprising:

a cassette member for containing sheets, said cassette member being detachably mountable on the paper feed section of an apparatus body;

separating pawls movably supported on both sides of the cassette member between an actuating position where said separating pawls rest on both sides of leading ends of the sheets and a non-actuating position where said separating pawls are retracted laterally from the sides of the leading ends of the sheets located in said cassette member, said separating pawls being supported vertically turnably relative to the sheet surface;

urging means for urging the separating pawls in a direction from said actuating position to said non-actuating position when said cassette member is detached from the paper feed section of the apparatus body; and

positioning rollers actuable by the mounting of said cassette member on the paper feed section for rotation in a vertical plane relative to sheet surface, said positioning rollers pushing said separating pawls to said actuating position when said cassette member is mounted on the paper feed section of the apparatus body and guiding said separating pawls to turn vertically relative to the sheet surface.

4,595,192

METHOD AND APPARATUS FOR PROCESSING SUBSTANTIALLY FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, UNWOUND FROM A STORAGE COIL OR PACKAGE

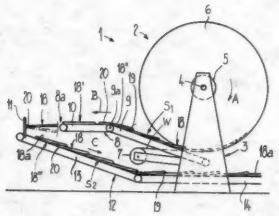
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Aug. 27, 1984, Ser. No. 644,793

Claims priority, application Switzerland, Sep. 5, 1983, 4858/83

Int. Cl.[4] B65H 29/66, 29/36, 5/24

U.S. Cl. 271—184 18 Claims



1. A method for processing substantially flat products, especially printed products, comprising the steps of:

unwinding said flat products from a storage coil in imbricated product formation;

conveying said unwound flat products in imbricated product formation along a first conveying path in a first conveying direction;

depositing individual ones of said flat products at an end of said first conveying path in imbricated product formation upon preceding ones of said unwound flat products which are moving in a second conveying direction substantially opposite to said first conveying direction along a conveying path arranged beneath said first conveying path; and

bringing each of said unwound flat products out or imbricated product formation with subsequent ones of said flat products before said end of said first conveying path.

4,595,193

STACKING APPARATUS FOR PAPER SHEETS

Kunihiko Nakamura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 12, 1984, Ser. No. 588,364

Claims priority, application Japan, Mar. 16, 1983, 58-42344

Int. Cl.[4] B65H 29/40

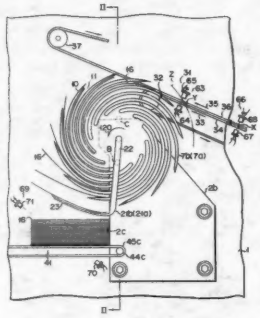
U.S. Cl. 271—187 10 Claims

1. A stacking apparatus for paper sheets having blade wheel means which is rotated such that an axis of rotation thereof is horizontally aligned and which has elongated blades extending in a direction opposite to a rotational direction of said blade wheel means from a center portion to a peripheral surface of said blade wheel means, feeding means for feeding the paper sheets one by one in each of elongated spaces formed between every two adjacent blades of said elongated blades at a speed exceeding a peripheral velocity of said blade wheel means, stationary stops for stopping rotation of the paper sheet at a position where the paper sheet, inserted in a corresponding one

of said elongated spaces, is rotated through a predetermined angle with rotation of said blade wheel means and for removing the paper sheet from said corresponding space to naturally drop the paper sheet;

stacking means for stacking the paper sheets sorted by and sequentially discharged in groups of a predetermined number from said blade wheel means;

a pair of arms each having substantially the same axis of rotation as that of said blade wheel means and passing by the side of paper sheets at a predetermined distance from said side, said paper sheets being supported to be rotated while said arm is not brought into contact with the paper sheets inserted in said elongated spaces, and which extends along a side surface of said blade wheel means;



a pair of receiving portions each supported by one said arm and located outside a peripheral edge of said blade wheel means so as to temporarily receive the paper sheet which naturally drops, said receiving portions being located at a common angular position about said axis upon receipt of said paper sheet and being arranged at a predetermined distance from the peripheral edge of said blade wheel means and each said receiving portion extending from said arm in a direction substantially parallel with said peripheral edge; and

controlling means including a control system for positioning said arm in a receiving position for temporarily stacking said paper sheets removed from said elongated space.

4,595,194

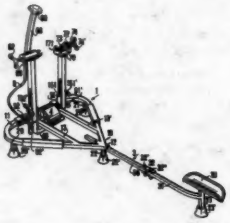
BAG PORTABLE BICYCLE TRAINING APPARATUS

Giovanni Previtali, Via Verdi 8,, 21040 Carnago (Varese), Italy

Filed Sep. 14, 1983, Ser. No. 532,173

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—73 **7 Claims**



1. A unitary collapsible bicycle training appartus for use with a bicycle comprising front and rear wheels, a rear axle, rear axle nuts and a rear wheel bracket, said apparatus comprising

a metal lattice base structure;

road simulating means comprising a roller rotatably attached to said base structure;

remote means for controlling said road simulating means;

a spine comprising first and second portions hingedly secured to one another and said first portion being extensible from said base structure so as to elongate said base structure wherein said spine is engageable with said front bicycle wheel and wherein said second portion of said spine is hingedly collapsible onto said base structure; and

longitudinally and vertically extensible means for stationarily mounting said bicycle to said apparatus, said vertically extensible means hingedly mounted to said base structure and engageable with said rear axle, rear axle nuts and rear wheel bracket of said bicycle, so as to support said bicycle, and to support said remote control means in a position convenient to the user of said apparatus.

4,595,195

APPARATUS FOR PRACTICING SKIING

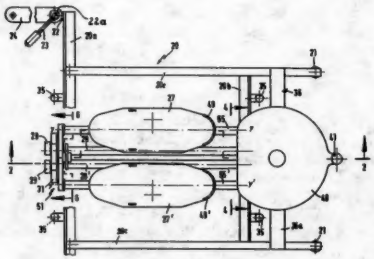
Dieter Miehlich, Gubener Strasse 13½, D-8900 Augsburg, Fed. Rep. of Germany

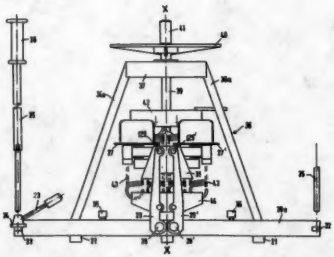
Filed Feb. 2, 1984, Ser. No. 576,191

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306087

Int. Cl.[4] A63B *69/18*

U.S. Cl. 272—97 **20 Claims**





1. An exercising apparatus, particularly for use by downhill skiers, comprising a stationary main frame; first and second shafts in said main frame; a swaying frame having a first and a second pair of aligned front and rear links each including a lower end portion mounted for pivotal movement about the axis of the respective shaft and an upper end portion, and carrier means pivotally secured to the upper end portions of said links for angular movement about parallel substantially horizontal axes; resilient means for biasing said swaying frame to a neutral position in which said links are disposed at the opposite sides of a first central vertical longitudinal symmetry plane extending between the lower end portions of said pairs of links, said links being pivotable with reference to said main frame to either side of said plane against the opposition of said

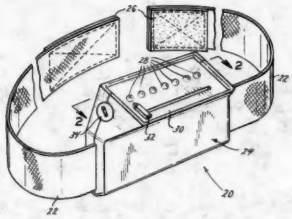
resilient means and said swaying frame having a second central longitudinal vertical symmetry plane which coincides with said first plane in the neutral position of said swaying frame; and first and second boot supporting platforms mounted on said carrier means at the opposite sides of said second plane, said platforms having third central longitudinal symmetry planes and the distance between said second plane and each of said third planes exceeding the distance between said second plane and each of said horizontal axes.

4,595,196

INCENTIVE SPIROMETER

Thomas P. Muchisky, 784 Hawthicket La., Des Peres, Mo. 63131, and James V. Young, 35 Benton Pl., St. Louis, Mo. 63104

Filed Oct. 13, 1983, Ser. No. 541,355
Int. Cl.[4] A63B *23/00*; A61B *5/08*
U.S. Cl. 272—99 **5 Claims**



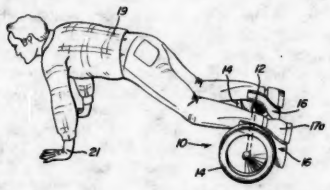
1. A breathing exercise device comprising:
a belt having first and second ends,
a joining member for joining the ends of said belt;
means attached to said joining member for permitting limited relative movement between said belt ends, whereby the belt can be placed around a lower chest and expand with the chest, wherein said means for permitting further includes means for resisting separation of said belt ends, wherein said means for resisting comprises a curved leaf spring having first and second ends mounted on said joining member wherein at least one end of said spring is slidably mounted in such a way as to permit straightening of the curved spring; wherein said first end of said belt is connected to the joining member and said second end of said belt is slidably mounted on the joining member and further secured to a portion of said springintermediate and means for measuring and indicating the relative separation between the ends of the belt.

4,595,197

WHEELED EXERCISE DEVICE

David R. Hagstrom, 802 S. 31st St., and Gregory J. Gaudreau, 2114 Burnstead Dr., both of Billings, Mont. 59101

Filed Dec. 9, 1983, Ser. No. 559,684
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—127 **6 Claims**



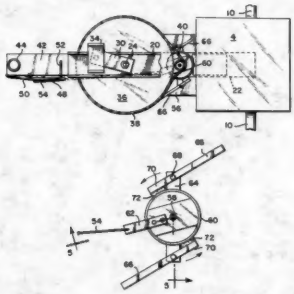
1. An exercise device comprising only one axle member, means for supporting a user's feet on the axle member, and wheel means associated with the axle member for providing rolling support for the axle member on a support surface and clearance for the user's feet from said surface with the user's feet engaging the supporting means, wherein the feet supporting means comprises a pair of stirrups on the axle member shaped for receiving the user's feet therein and for engaging and supporting the user's shins, the device including connector means for connecting the respective stirrups to the axle member in front of the user's respective ankles.

4,595,198

CENTRIFUGAL BRAKE FOR EXERCISE MACHINE

Roger C. Sparks, Rte. 1 Box 950, Ellensburg, Wash. 98926

Division of Ser. No. 159,487, Jun. 16, 1980, Pat. No. 4,483,532. This application Jan. 6, 1983, Ser. No. 455,927
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—132 **2 Claims**



1. A centrifugal brake for use in conjunction with exercise machines or the like comprising:
rotatable shaft means which rotates in response to the exercise being performed,
braking means adapted to rotate with the shaft means, said braking means comprising pivoted lever arms with attached brake pads secured to one end of each of said lever arms, said lever arms being attached to said shaft means and rotatable therewith, and a brake drum fixedly attached to the shaft and being spring biased about its axis of rotation so as to permit a few degrees of rotation as a result of the friction engagement of the rotating brake pads and the drum, the lever arms are heavier on one end than the other so that the greater the rate of rotation of the shaft, the greater the pressure exerted by the brake pads upon the brake drum, and causing a greater resistance to the exercise.

4,595,199

BASKETBALL GAME APPARATUS

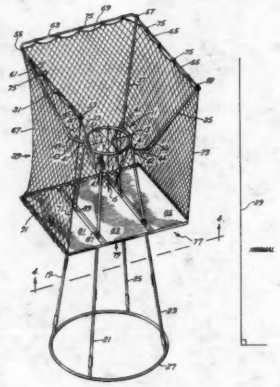
James C. Offutt, Peoria, Ill., assignor to Rimball, Inc., Peoria, Ill.

Filed Sep. 19, 1984, Ser. No. 652,312
Int. Cl.[4] A63B *63/08*
U.S. Cl. 273—1.5 A **2 Claims**

1. A basketball goal apparatus for free standing positioning on a floor for use with a basketball comprising:
a hoop and net goal including a circular rim of a size for receiving the basketball, said rim being disposed in a plane substantially parallel to the floor;
four legs attached to and depending from said rim at an angle with respect to normal, for supporting said goal a spaced distance above the floor;
ball containment means including:
(i) four standards, each said standard secured to a said leg at a point spaced below the plane of said rim and ex-

tending upward at an angle to said normal and passing through said plane at a point laterally spaced from said rim by at least half the diameter of the basketball, said standard extending to a point approximately three feet above said plane;

(ii) net means supported by said standards, said net means including netting substantially disposed in three orthogonal side planes defined by the ends of said standards



and disposed surrounding said rim, said netting extending above and below said rim plane in each of said side planes; and

ball return means comprising a planar platform, said platform including three planar boards juxtaposed in a plane with a pair of legs passing between a pair of said boards, said three planar boards forming a return plane and being tilted with respect to normal.

4,595,200

SOUND EMITTING BALL

Hideomi Shishido, Hiroshima, Japan, assignor to Molten Corporation, Hiroshima, Japan

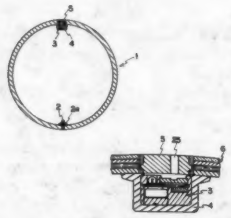
Filed Jun. 18, 1984, Ser. No. 621,632

Claims priority, application Japan, Jun. 21, 1983, 58-112047; Sep. 22, 1983, 58-147405[U]; Feb. 28, 1984, 59-28716[U]; Feb. 28, 1984, 59-28718[U]; Mar. 21, 1984, 59-40840[U]

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[4] A63B *41/00*

U.S. Cl. 273—58 G **10 Claims**



1. A sound emitting ball, comprising

(a) a ball having an airtight bladder for giving impact resilience to the ball in which compressed air is charged through an air injection valve,

(b) a concave housing provided within the ball on the opposite portion of the bladder with respect to the valve and contacting the surface of the bladder while keeping the airtightness of the bladder,

(c) a cover for concealing an opening in the housing,

(d) means for detecting an external force applied to the ball and producing a signal in response thereto,

(e) means comprising of an integrated circuit for generating a sound signal according to the signal from the detecting means,

(f) means for emitting sound according to the signal from said sound signal generating means, and

(g) a battery power source for said above detecting means, sound signal generating means and emitting means, said detecting means, said sound signal generating means, said emitting means and said battery power source being accommodated in the housing, and such that the sum of the weights of the housing, the cover, said detecting means, said sound signal generating means, said emitting means and said battery power source does not substantially interfere with the impact resilience of the ball and is substantially the same as the weight of the valve.

4,595,201

TENSIONABLE RACKET HAVING UNIQUE STRINGING PATTERN

Herwig Fischer, Kickenstrasse 88, D-4156 Willich 4, Fed. Rep. of Germany

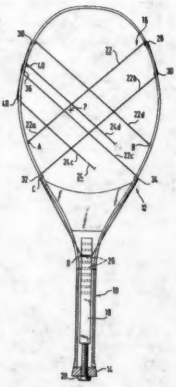
PCT No. PCT/EP83/00093, § 371 Date Nov. 30, 1983, § 102(e) Date Nov. 30, 1983, PCT Pub. No. WO83/03358, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 29, 1983, Ser. No. 561,595

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211738; Jul. 27, 1982, 8221340[U]

Int. Cl.[4] A63B *51/12*

U.S. Cl. 273—73 E **11 Claims**



10. A tennis racket for use in hitting a tennis ball comprising:

a frame having a head and a handle portion, a plurality of low friction elements at spaced apart locations about said frame head portion, and first and second sets of plural operative string elements each having a plurality of substantially parallel lengths extending across the frame in only one direction and being spaced apart within said frame head portion, lengths of different ones of said string elements within the same one of said first and second string sets being interleaved interwoven said first and second string sets crossing within said frame, said lengths of said string elements being spaced apart within said frame a sufficient distance such that a struck tennis ball cannot substantially strike more than one length of the same string element, each of said string elements passing over a predetermined series of individual ones of said

plurality of low friction elements so that said plurality of string elements are movable relative to said frame at said low friction elements, whereby all strings striking a tennis ball impinging upon the frame head portion can elongate both directions from the area of engagement with the struck tennis ball to provide elasticity, and tension adjusting means connected to said first and second sets of string elements for simultaneously tensioning said string elements.

4,595,202

GAME APPARATUS UTILIZING A BALL CONTROLLED ELECTRICAL SWITCH

Abraham Torgow, 25 Concord Cir. Howell, N.J. 07731

Continuation-in-part of Ser. No. 222,667, Jan. 2, 1981, Pat. No. 4,477,078, which is a continuation of Ser. No. 23,730, Mar. 26, 1979, Pat. No. 4,264,073. This application Jun. 18, 1984, Ser. No. 621,513

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.[4] A63F *7/30*

U.S. Cl. 273—122 A **9 Claims**

1. An apparatus for playing a game, comprising:

(i) a housing structure, said housing structure having an entry opening, said entry opening being adaptable to afford passage of a ball,

(ii) an elongated ball guiding means extending from a first end to a second end, said guiding means including a chute portion positioned below said entry opening and adapted to cause a ball dropping onto said chute portion to roll therealong towards said first end, said first end having a ball exit opening for said ball to be withdrawn from said housing, said ball guiding means including a ball support which is resiliently urged to a raised position, said support being adapted to be moved downward to a lowered position by the weight of a ball received thereon, said ball support being elongated and extending along a major portion of the length of said chute portion such that when a ball is received on said support it is moved to a lowered position for a period of time determined by the ball rolling along the support and passing off an end thereof, said chute being adapted to contain said ball on said ball support, said chute and said ball support path being configured so as to permit a useful ball support length without conflicting with the best structural locations for the placement of the other parts that go into the games construction, said ball support having a length that in conjunction with its downward slope is such that said ball rolling down its surface will roll for at least one-half of a second before it rolls off the ball support end, said downward slope having a declination of less than 15 degrees, said ball support's movable portion being at least 8 inches but no more than 30 inches in length, said ball support's movable portion weighing no more than 2 ounces,

(iii) an electric powered device and,

(iv) a source of electrical current, a switch means associated with said ball support and arranged to be open when said ball support is not in lowered position and to be closed when said ball support is not in raised position,

(v) electrical wiring connecting said switch means and said electrical powered device and terminals for connection to a current source such that a current circuit is completed to said electric powered device when said switch means is closed by the presence of a ball rolling on said support, said switch means comprising a first electrical contact carried by said ball support, and a second electrical contact adapted to complete an electrical connection with said first contact.

4,595,203

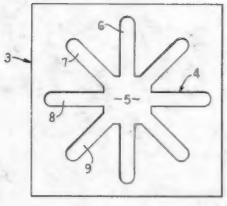
PUZZLE READING DEVICE

Arthur D. DeLano, P.O. Box 2065, Battle Creek, Mich. 49016, and Truman H. Langs, Jr., 287 Timber La., Battle Creek, Mich. 49017

Filed Jun. 21, 1984, Ser. No. 623,813

Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—148 R **18 Claims**



2. A puzzle reading device adapted for solving a puzzle defined by a sheet having a matrix of letters thereon, said letters being arranged so that, as an entirety, said matrix of letters is meaningless, said matrix however containing therein a limited number of predetermined identifiable expressions, each of said expressions being defined by a series of said letters within a horizontal, vertical or diagonal row of said matrix, said device comprising a plate having means defining a plurality of diametrical, intersecting, elongated windows in said plate, each of said windows substantially corresponding in size and shape to said expressions such that said expressions can be viewed through said windows distinctly from letters in adjacent rows of said matrix, wherein said windows include an opening in said plate, and wherein said opening includes a central hole in said plate, said hole defining a parallelogram, and a plurality of diametrical, elongated slots which intersect at said hole.

4,595,204

DEVICE FOR PRACTICING GOLF CLUB SWING

George H. Patterson, 80 Van Greenby Rd., Lowell, Mass. 01851

Filed Jul. 2, 1985, Ser. No. 751,244

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—186 A **11 Claims**

1. A practice device, for use by a person in swinging an elongated club-like instrument of the type having a shaft with a distal end for striking a ball and a proximal end with an elongated handle, the handle having an end portion and a centrally located vent hole in the butt thereof;

said device comprising an elongated, lightweight tubular member adapted to form an extension of said shaft, having an inner end and an outer end, said extension being of sufficient length to normally extend from its inner end proximate the end portion of said club handle, upwardly

under the left arm pit to its outer end in rear of the left shoulder of the person using said device;

affixation means at the said inner end of said extension,

including a socket for receiving the end portion of the handle of said shaft and removably clamping said end portion in said socket, and including an axially extending, central pin adapted to slidably fit in said vent hole.

4,595,205

JAI-ALAI CESTA

Winfred Ruperto, 47 El Camon Real, Burlingame, Calif. 94010

Continuation-in-part of Ser. No. 464,157, May 7, 1983, Pat. No. 4,502,690. This application Feb. 19, 1985, Ser. No. 702,489

Int. Cl.[4] A63B *59/02*

U.S. Cl. 273—326 **6 Claims**

1. An apparatus for catching and throwing projectiles comprising:

first means for grasping said apparatus;

second means affixed to the first means for catching and throwing said projectile, said second means molded of a single piece of a resilient material such that the inner surface of the second means has a repeating pattern of ridges and depressions and the outer surface of the second means has a pattern complementary to the pattern of the inner surface, said repeating pattern momentarily flexes on impact of a received projectile to dissipate the impact thereof and to impart spin to the projectile when thrown.

4,595,206

SEAL WITH INNER AND OUTER SLIDABLY CONTACTING RINGS

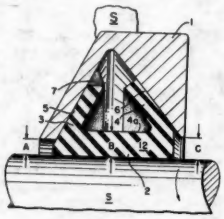
Helmut Hölzer, Weinheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,788

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1984, 3409981

Int. Cl.[4] F16J *15/34*

U.S. Cl. 277—25 **16 Claims**



1. A seal for the clearance between a relatively-rotating shaft and an opening in a structure, comprising:

an outer ring having an outermost shape for fixed, sealed mounting across the opening in the structure, a circular passage axially therethrough, and an inwardly-open groove circumferentially around the passage and having axial boundary surfaces which converge toward each other outwardly from the axis of the outer ring; and

a concentric, elastically-yielding inner ring having a cylindrical midsection, an axial passage through the midsection for sealingly receiving the shaft for relative rotation therewith, and two flanges flanking the midsection, extending outwardly from the axis of the inner ring, and elastically bearing, respectively, on one of the boundary surfaces thereby respectively associated with the flanges for sealing, the outside diameter of the midsection being greater than the inside, passage diameter of the outer ring at least on one side of the groove.

4,595,207

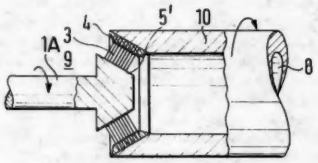
BRUSH SEAL LABYRINTH SEALING MEANS BETWEEN TWO MACHINE PARTS

Joachim Popp, Dachau, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 8, 1985, Ser. No. 753,234

Int. Cl.[4] F16J *15/447*

U.S. Cl. 277—53 **17 Claims**



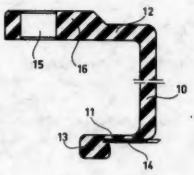
1. Sealing means between two machine parts for sealing separate spaces at different pressures from one another, one of said machine parts having a principal axis, said sealing means comprising a brush seal including a holder and a plurality of bristles extending from said holder, and means supporting said holder on the other of said machine parts at an acute angle to said principal axis of said one machine part such that said bristles abut against a surface of the other of said machine parts perpendicularly thereto.

4,595,208

LINING OF NON-METALLIC MATERIAL

Nils A. Jönsson, Staffanstorp, and Bengt Mossberg, Lund, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

PCT No. PCT/SE83/00317, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/01209, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 8, 1983, Ser. No. 610,290
Claims priority, application Sweden, Sep. 14, 1982, 8205231
Int. Cl.[4] F16J *15/00*
U.S. Cl. 277—206 R 10 Claims



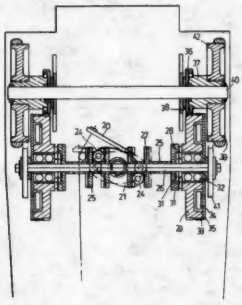
1. In combination with a plate heat exchanger having a plate member which is a frame plate or a pressure plate with opposite side surfaces, a connecting tube for passage of a fluid to or from the heat exchanger by way of a port in said plate member, and a heat exchange plate adjacent one of said side surfaces and having an opening through which said tube and port communicate with the interior of the heat exchanger, a lining of non-metallic material for lining said port and comprising a cylindrical portion and a thin annular flange extending radially from one end of the cylindrical portion and integral therewith, said cylindrical portion covering the wall of said port and forming a passage interconnecting said tube and said opening in the heat exchange plate, said flange being interposed between the heat exchange plate and said plate member and resting against an unmachined part of said one surface, and an annular bulge integral with said flange and engaging said heat exchange plate around its said opening to form a seal between said plate member and the heat exchange plate.

4,595,209

SKATEBOARD

Kun K. Tsai, Tai Chung Hsing, Taiwan, assignor to Li Mao Sports Co., Inc., Taiwan

Continuation-in-part of Ser. No. 531,698, Sep. 13, 1983. This application Apr. 9, 1984, Ser. No. 598,021
Int. Cl.[4] A63C *1/00, 17/14*
U.S. Cl. 280—11.115 14 Claims



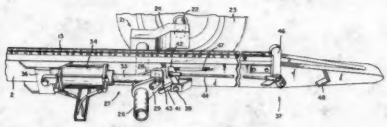
1. A manually powered skateboard, comprising:
a rear wheel axle;
a rear hub member having a rear wheel mounted thereon;
a transmission wheel mounted on said rear wheel axle, and coaxial with said rear hub member;
means for connecting said transmission wheel to said rear hub member and which comprises a one-way clutch; a drive wheel engaged with said transmission wheel; a drive shaft disposed under a platform to drive said transmission wheel and on which said drive wheel is mounted, said drive shaft being in a parallel position relative to said rear wheel axle; a flexible tension element located in an axial position relative to said rear axle and wound on said drive wheel and pullable by a user to rotate said drive wheel and in turn said transmission wheel, and first spring means acting against a drive rotation of said drive wheel caused by pulling of said flexible tension element; a clutch member for selectively rotating with said drive wheel to effect braking action on a rim portion of said rear wheel; and brake means engageable with said clutch member.

4,595,210

FRUIT BIN TRAILER

Robert E. Groeing, 201 S. 88th Ave., Yakima, Wash. 98902

Filed Feb. 11, 1985, Ser. No. 700,284
Int. Cl.[4] B60P *1/18*
U.S. Cl. 280—43.23 8 Claims



1. A load hauling apparatus comprising:
a load support bed connected at one end to a first ground support means:
second ground support means for raising and lowering the other end of said bed to move the bed from a generally horizontal raised position to a tilted lowered position including an axle assembly including axle mounted ground wheels and a rotatable cross shaft supporting said bed, the axis of said cross shaft being offset from the wheel axis, whereby rotation of said cross shaft moves said bed between the raised and covered positions:
load restraining means positioned in proximity to said other end of said bed and movable between a released position below the surface thereof and a load restraining position above the surface of said bed:
actuator means operatively associated with said second ground support means and connected to move said load restraining means to the load restraining position when the bed is moved to the generally horizontal raised position; and
cam means on said cross shaft for contacting said actuator means upon rotation thereof in the direction to move the bed to the horizontal raised position so as to move said load restraining means to the load restraining position.

4,595,211

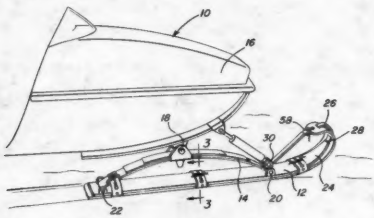
SNOWMOBILE SKI UNDERLAYER

James W. Fitzpatrick, Box 132, Star Rte., Bonner, Mont. 59823

Filed Mar. 29, 1984, Ser. No. 594,738
Int. Cl.[4] B62B *17/00*
U.S. Cl. 280—28 10 Claims

1. In combination with a snowmobile ski including an under surface subject to a build up of frozen snow and/or ice thereon under certain temperature and snow conditions and to the extent which seriously impedes the forward movement of the associated snowmobile due to increased resistance to movement of the ski over a snow cover, a ski underlayer comprising a flexible strip of smooth plastic material, said strip being

removably mounted upon said ski beneath the latter and covering, from beneath, at least substantially all of the under surface portions of said ski, said ski including an elongated, arcuate, downwardly opening and longitudinally extending tip brace, one end portion of said strip projecting outwardly beyond the forward tip end of said ski, said one end portion being reversely bent back over said tip end and including opposite side portions thereof passing rearwardly along and beyond corresponding sides of the forward portion of said tip brace, and anchor means releasably anchoring the opposite side portions of said reversely bent one end portion of said strip to said ski rearwardly of said tip brace forward portion.



4,595,212

FOLDING SPORTS WHEELCHAIR

Gilbert E. Haury, Grafton; Nathalal G. Patel; Walter G. Lockard, both of Elyria; Thomas R. Wiatrak, Brunswick, and Neal J. Curran, Fairview Park, all of Ohio, assignors to Invacare Corporation, Elyria, Ohio

Continuation-in-part of Ser. No. 442,037, Nov. 16, 1982, Pat. No. 4,500,102. This application Nov. 3, 1983, Ser. No. 548,370

Int. Cl.[4] B62M *1/14*; A61G *5/02*

U.S. Cl. 280—242 WC **20 Claims**

1. A folding wheelchair comprising:

a frame assembly including left and right lower side frame portions and left and right back support frame portions;

an operator supporting means including a lower supporting portion operatively connected with the left and right lower side frame portions for supporting the operator and a back supporting portion operatively connected with the back support frame portions for supporting the operator's back;

left and right rear wheel mounting assemblies for mounting left and right rear wheels to the left and right side frame portions, respectively, the rear wheel mounting assemblies being connected with the lower side frame portions;

a pair of front wheel mounting assemblies for mounting front wheels to the lower side frame portions;

a folding mechanism interconnecting the left and right side frame portions for selectively moving the side frame portions into a close parallel folded relationship, the folding mechanism including:

a left pivot shaft,

a right pivot shaft,

a first left spacer member connected with the left pivot shaft for rotation therewith and pivotally connected with the left side frame portion,

a first right spacer member connected with the right side pivot shaft for rotation therewith and pivotally connected with the right side frame portion,

a second left spacer member connected with the left pivot shaft for rotation therewith and pivotally connected with the left side frame portion,

a second right spacer member connected with the right pivot shaft for rotation therewith and pivotally connected with the right side frame portion, and,

a rotation coordination means for coordinating the relative rotation of the left and right pivot shafts to rotate the first and second left and right spacer members in coordination with each other such that the first and second left and right spacer members rotate in coordination with each other as the wheelchair is folded and unfolded.

4,595,213

AUXILIARY WHEEL ARRANGEMENT OF BICYCLE

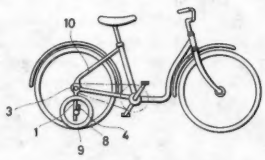
Kimihiro Tsuchie, 35-1 Kinugasa, Tenjinmori-cho, Kita-ku, Kyoto, Japan

Filed Mar. 23, 1984, Ser. No. 592,586

Claims priority, application Japan, May 28, 1983, 58-80614[U]

Int. Cl.[4] B62H *1/00*

U.S. Cl. 280—293 **11 Claims**



1. An auxiliary wheel arrangement for bicycle comprising:

an arm extending to one side from a bicycle body adjacent a rear wheel of said bicycle to be vertically displaceable;

a means for imparting a pivotal displacement to said arm for lowering the tip thereof; and

an auxiliary wheel attached to the tip of said arm, said auxiliary wheel having a static frictional resistance against the ground which prevents sliding of the auxiliary wheel relative to the ground in a direction transverse to said bicycle when said bicycle is stationary and having a rolling frictional resistance against the ground which allow sliding of said auxiliary wheel relative to the ground in a direction transverse to said bicycle when said bicycle is moving.

4,595,214

BICYCLE PARKING BRAKE

Verlon D. Downing, Centerville, Ohio, assignor to Raleigh Cycle Company of America, Miamisburg, Ohio

Filed Apr. 30, 1984, Ser. No. 605,701

Int. Cl.[4] B60H *3/04*

U.S. Cl. 280—296 **6 Claims**

3. In a bicycle having a frame including a down tube extending downwardly and rearwardly from a head tube wherein is journaled a fork holding a front wheel having a tire, and having also a pair of cables extending along the underside of said down tube for operating a gear changer on said bicycle, said cables having sheaths covering the upper portions thereof, the combination of a retainer for the lower ends of said sheaths and

a parking brake for releasably holding the front wheel in line with the rest of said frame, comprising:

(a) a housing mounted on the underside of said down tube in close proximity with said front wheel tire,

(b) said housing having a recess therein which is open at the front and along the underside of said housing,

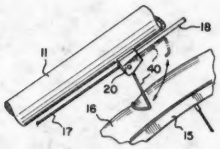
(c) said housing having a pair of bores therethrough located above and outwardly of said recess which receive said cables therethrough,

(d) said bores having counterbores at the forward ends thereof which receive and retain the lower ends of said cable sheaths respectively,

(e) said housing including a wall at the back of said recess which is substantially normal to the length of said front tube and a bottom wall extending substantially parallel with said down tube from said back wall toward the front end of said housing,

(f) said housing including side walls extending from said back wall toward the front end of said housing,

(g) said housing having a pair of aligned holes in said side



walls adjacent the corners of said recess formed by said side, back and bottom walls,

(h) a generally U-shaped spring wire form having its center portion shaped to engage the front wheel tire and having also a pair of generally parallel leg portions received between said housing side walls,

(i) said legs having oppositely outwardly turned end portions received in said holes in said side walls to form a pivotal mounting for said form in said recess,

(j) each of said side walls having a groove therein extending from said hole therein adjacent the junction of said side wall with said rear wall and a second groove therein extending from said hole therein adjacent the junction of said side wall with said bottom wall, and

(k) means spreading said end portions of said arms outwardly into substantially parallel relation and contact with the opposed surfaces of said side walls,

(l) whereby said arms are releasably retained with a snap action within one or the other of said pairs of grooves when said wire form is moved to a position adjacent said back or bottom wall of said recess.

4,595,215

COATING MATERIAL AND COATING FOR A SKI, FOR VARIABLE SNOW CONDITIONS, AND METHOD OF MANUFACTURE OF SAME

Antti-Jussi Tiitola, Tampere, Finland, assignor to Karhu-Titan Oy, Finland

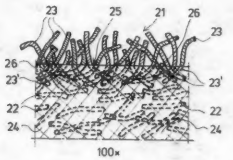
Filed Feb. 16, 1983, Ser. No. 466,888
Claims priority, application Finland, Feb. 19, 1982, 820552
Int. Cl.[4] A63C *5/04*
U.S. Cl. 280—604 **14 Claims**

1. A cross-country ski having gliding surfaces running substantially the length of a longitudinal axis thereof and having therewith a central region between said gliding surfaces extending partially along the longitudinal axis thereof and over a mid-point of the length thereof, said central region having a coating which serves as an ascending aid and comprising

a soft, elastically-behaving substance having fibrous particles distributed therethrough, at least a portion of said particles projecting from the surface of said substance and thereby from said running surface,

whereby gliding is effected along the gliding surfaces while gripping is effected by said particles projecting from said soft elastically-behaving substance along the central region of the ski, the gripping serving as an ascending aid when required.

14. A ski having a bottom central region of a running surface thereof coated for variable snow conditions, said running surface having gliding surfaces on either side of said bottom central region, said gliding surfaces running substantially the length of a longitudinal axis thereof and said central region



extending partially along the longitudinal axis thereof and over a mid-point of the length thereof, in particular a cross-country or long distance running ski, said ski comprising

polyethylene or a material having a predetermined low coefficient of gliding friction coated on said gliding surfaces, and

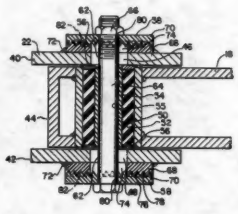
adhesive coating material coated on said bottom central region of said running surface, said adhesive coating material comprising a soft, elastically-behaving substance having fibrous particles distributed therethrough, at least a portion of said particles projecting from the surface of said substance and thereby from said running surface.

4,595,216

VEHICLE SUSPENSION STRUCTURE

Nathan C. Ware, North Muskegon, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jul. 20, 1984, Ser. No. 632,721
Int. Cl.[4] B60G *9/02, 11/28*
U.S. Cl. 280—661 **20 Claims**



15. In a vehicle having a suspension system adapted to support the vehicle with respect to ground engaging means and wherein the vehicle includes a bracket portion to which a member of the suspension system is adapted to be secured, a selectively adjustable securing apparatus for adjustably securing the suspension member with respect to the bracket portion comprising:

first engagement means fixedly secured with respect the bracket portion;

said first engagement means including thereon first formed means;

second engagement means moveably disposed with respect to the bracket portion;

said second engagement means including thereon second formed means which are cooperable with said first formed

means for complementary mechanical interengagement between said first and second engagement means when said first and second engagement means are in confronting relationship to permit selective adjustable positioning of said second engagement means with respect to said first engagement means in any of a plurality of positions spaced apart in a predetermined lateral direction and said first and second formed means having means to preclude lateral movement of said second engagement means with respect to said first engagement means in a lateral direction transverse to said predetermined direction; and

retention means adapted to releasably secure the suspension member to the bracket portion and cooperable with said first and second engagement means to selectively maintain said complementary mechanical interengagement therebetween in any of said plurality of positions, said retention means being constrained to move with said second engagement means during positioning thereof in any of said plurality of positions whereby the suspension member which is engaged by said retention means is securable with respect to the bracket portion in a selected position by securing said first and second engagement means with said retention means in said complementary mechanical interengagement at a corresponding one of said plurality of positions.

4,595,217

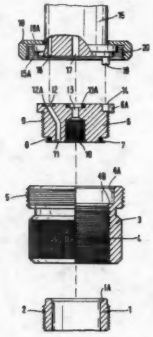
COUPLING MEMBER FOR VESSELS FOR USE IN TWO-WAY EXTRACTION SYSTEMS

Wilhelm Siegel, Mörfelden, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,502

Int. Cl.[4] F16K *55/00*

U.S. Cl. 285—25 **21 Claims**



1. A coupling member for use in the liquid-tight and gas-tight connection of vessels of varying sizes with a two-way double bore extraction system, said coupling member comprising two parts, an adaptor and union nut means, said adaptor being cylindrical having a lateral bore and a central bore therethrough and having, on its face connectable with the extraction system, a diameter compatible therewith, and on its opposite face connectable with a vessel mouth, a diameter compatible therewith, sealing means associated with the adaptor for effecting sealing thereof with the vessel mouth and said union nut means having a first connecting portion having means for being coupled directly to the vessel mouth and a second connecting portion rotatably movable with respect to the first connecting portion adapted for being coupled to the extraction system, and said first connecting portion containing said adaptor.

4,595,218

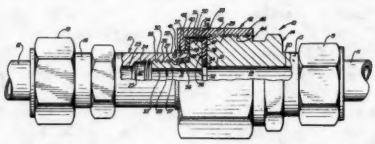
INSULATIVE COUPLING

John F. Carr, Oak Lawn; Leonard J. Kowal, Prospect Heights, and Albert J. Schwarz, Lincolnwood, all of Ill., assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Aug. 4, 1983, Ser. No. 520,494

Int. Cl.[4] F16L *59/00*

U.S. Cl. 285—47 **21 Claims**



1. An insulative coupling for coupling a first tube to a second tube for fluid flow therebetween, said coupling comprising:

a first body defining a first through a bore having an axially outer end and an axially inner end;

means for connecting the first tube sealingly to said outer end of the first body to have fluid flow communication with said first bore;

a second body defining a second through bore having an axially outer end and a radially enlarged axially inner end;

means for connecting the second tube sealingly to said outer end of the second body to have fluid flow communication with said second bore;

an annular connector received between said inner end of the first body and said inner end of the second body, and defining a third through bore having a first axial end communicating with said first bore and a second axial end communicating with said second bore for providing a fluid flow connection therebetween;

means for removably sealingly securing said connector to said second body; and

means for electrically insulatively securing said first body to said second body comprising an annular insulative washer, an annular insulative bushing formed of synthetic resin, a tubular nut having a first portion having threaded means removably threaded about said first body, and a radially inwardly turned flange, said washer being compressed between said first body and said connector and said bushing being compressed between said nut flange and said connector as an incident of threaded tightening of said nut first portion to said first body, said washer defining means for electrically insulating said first body and nut from said connector, and said bushing defining means for electrically insulating said nut from said second body and connector, said washer and bushing defining a gap radially outwardly of said connector for accomodating expansion of said washer toward said bushing, and an insulative O-ring exposed to the communicating bores and being sealingly compressed between said first body and connector radially inwardly of and outwardly abutting said washer as a further incident of said threaded tightening of said nut first portion to said first body, said washer being inwardly exposed to fluid in said bores.

4,595,219

GAS TIGHTLY SEALED JOINT IN OIL FIELD TUBULAR GOODS

Friedrich Lenze, Ratingen, and Erwin Jedamzik, Kempen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,382

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203857724

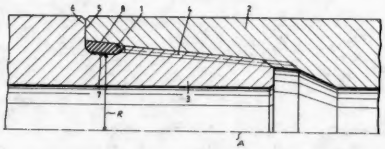
Int. Cl.[4] F16L *25/00*

U.S. Cl. 285—333 **7 Claims**

1. Gas tight joint between a pin member and a sleeve or a

box member in oil field tubular goods wherein the pin member is provided with an outer threading and the sleeve or box member is provided with an internal threading to receive the threading of the pin member when the joint is made up comprising:

an annular groove in the pin member having a depth of at least five percent (5%) but not more than twenty percent (20%) of the diameter of the bottom of the groove; and



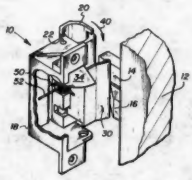
a polytetrafluoroethylene ring in the groove which has been heated to a temperature in excess of the crystalline amorphous transition temperature but below the liquification and decomposition temperatures of polytetrafluoroethylene for placement into the groove without stretching following which the ring was cooled to be seated in the groove of the pin member.

4,595,220

DEAD BOLT SENSING AND STRIKE CLOSING MECHANISM

Leland J. Hanchett, Jr., Phoenix, and Mark A. Lawrence, Mesa, both of Ariz., assignors to Hanchett Entry Systems, Inc., Phoenix, Ariz.

Filed Feb. 27, 1984, Ser. No. 583,756
Int. Cl.[4] E05B *15/02*
U.S. Cl. 292—341.17 **7 Claims**



1. A mechanism for locking and releasing a door having a dead bolt, comprising:

a strike case adapted to receive the dead bolt;

a keeper pivotally mounted to said strike case for opening and closing said strike case;

an abutment member connected to said keeper and selectively pivotable with said keeper; and

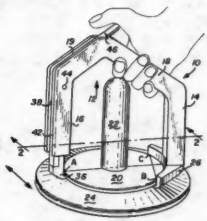
means connected to said strike case for engaging said abutment member to prevent said abutment member from pivoting with said keeper when the dead bolt is retracted within the door, and for sensing the presence of the dead bolt in said strike case so as to disengage said abutment member and allow said abutment member to pivot with said keeper as the door is opened with the dead bolt extended.

4,595,221

DISC TRANSFER DEVICE

Richard de Geus, Cupertino, and James J. Grubish, San Jose, both of Calif., assignors to Priam Corporation, San Jose, Calif.

Filed Oct. 9, 1984, Ser. No. 658,536
Int. Cl.[4] B66C *1/30*
U.S. Cl. 294—16 **12 Claims**



1. A disc transfer device for use with hard data storage discs comprising:

(a) a first fixed gripper for fitting about a peripheral edge of a hard data storage disc;

(b) a second pivotable gripper for fitting about said peripheral edge of said disc, the first and second grippers being formed of a smooth, rigid and soft material, each gripper including at least one disc contact point comprising a horizontal notch formed therein to be tangential to said disc edge;

(c) a handle for supporting the first and second grippers in an opposed manner whereby said disc may be gripped therebetween about a diameter of said disc, the handle having dimensions sufficient to enable it to fit over a disc storage spindle; and

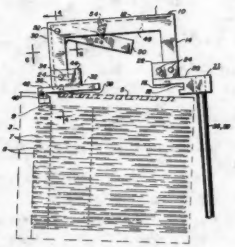
(d) a biasing means for biasing the second gripper towards the first gripper, the biasing means including an actuator arm means to urge the second gripper against the biasing means whereby said disc may fit within the first and second grippers.

4,595,222

CARRIER HANDLE

David D. Schumacher, Plymouth, Minn., assignor to FSI Corporation, Chaska, Minn.

Filed Sep. 28, 1984, Ser. No. 655,253
Int. Cl.[4] B65G *7/12*
U.S. Cl. 294—16 **2 Claims**



1. A device attachable to an end panel of a wafer carrier for manipulating the carrier and retaining wafers at the open side of the carrier, comprising

first and second opposing clamp jaws for attaching to opposite edges of the carrier end panel,

an elongate articulated frame having the first jaw mounted thereon and including a guiding foot with an elongate bottom,

a mounting plate affixed to the second jaw and lying against the bottom of the guide foot for movement therealong and maintaining the orientation of the second jaw with respect to the first jaw,

an operating means on the frame connected with the mounting plate for moving the plate and second jaw along the guide foot toward and away from the first jaw, and

a retaining rod connected to the frame adjacent the first jaw and extending transversely from the first jaw to traverse the open side of the carrier and retain the wafers therein.

4,595,223

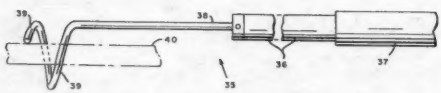
REMOTE CONTROL LINE ASSEMBLY

Robert L. Hawie, Stratford, Conn., assignor to Hawie Manufacturing Company, Bridgeport, Conn.

Filed Feb. 19, 1985, Ser. No. 702,488

Int. Cl.[4] A43F *13/06*

U.S. Cl. 294—19.1 **10 Claims**



1. An assembly for the remote opening and closing of the spring-biased closure section of a carabiner or ring fastener at the end of a flexible tie line, said assembly comprising a tie member and an extension member, said tie member comprising a flexible tie line attached to the tie end of a carabiner, said carabiner being an enclosed ring fastener having said tie end to which said tie line is attached, an opposed hook end and sides connecting said ends, one said side comprising a pivot section which is pivotably-attached adjacent said tie end and is spring-biased to closed position to close said ring, and which is depressible into the center of said ring to open position to permit an eye member to be engaged over said hook end and locked onto said carabiner when said pivot member returns to closed position, said extension member comprising an elongate handle supporting a rigid, line-following contact member which surrounds said tie line and is extendable by said handle for movement along said flexible tie line, over the tie end of the carabiner and into engagement with said pivot section to depress said pivot section into open position while said flexible tie line is held taut, and being withdrawable from the tie end of the carabiner to permit said pivot section to return to closed position under the pressure of its bias, whereby said pivot section can be opened and closed from a remote distance by the manipulation of said extension member.

4,595,224

CARRYING DEVICE FOR CONTAINERS

Otmar Kaup, Aschaffenburg, Fed. Rep. of Germany, assignor to Kaup & Co. KG, Aschaffenburg, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,820

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419363

Int. Cl.[4] B66C *1/66*

U.S. Cl. 294—81.2 **15 Claims**

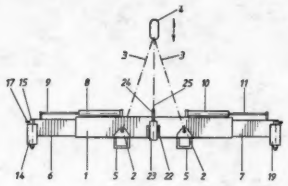
1. A carrying device for lifting a container by means of a lifting unit, comprising

a frame, said frame having four corners and defining a width and a length, the width of said frame being adjustable,

lifting means located at each of the corners of said frame, said lifting means adapted to engage and disengage said container,

hydraulic means associated with said frame and said lifting means for adjusting the width of said frame to conform to the width of said container and for actuating said lifting means, and

engagement means mounted on said frame connecting said carrying device to said lifing unit,



said engagement means including a traction member associated with said hydraulic means, said hydraulic means being actuated by said traction member in response to said carrying device being lifted by said lifting unit.

4,595,225

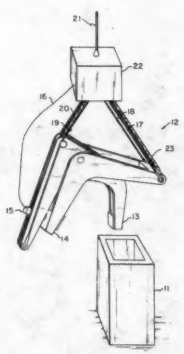
METHOD AND APPARATUS FOR LIFTING INGOT MOLDS AND LIKE OBJECTS

Mern S. Kemble, 130 Entrance Way, New Kensington, Pa. 15068, and Matthew Mancusso, 833 Second Ave., Verona, Pa. 15147

Filed Jan. 6, 1984, Ser. No. 568,819

Int. Cl.[4] B66C *1/42*

U.S. Cl. 294—86.41 **3 Claims**



1. A lifting tong, comprising:

a. a generally L-shaped housing member;

b. a first grappling member fixedly connected to said housing member;

c. a second grappling member movably connected to said housing member and positioned generally parallel to said first grappling member;

d. electromagnetic activation and deactivation means for causing said second grappling member to lock and unlock to said housing member and positioning means for causing said second member to move in a direction away from and toward said first grappling member and to become attached and detached to a portion of said housing so as to permit releasing and grasping of an at least partially hollo object by said first and second grappling members, said activation means being located proximate to said second grappling member;

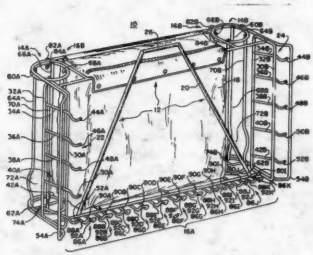
e. positioning means connected to said housing member at both end portions of the housing member for causing a rotational change of position of said tong; and

f. means connected to said housing member for lifting and lowering said tongs.

4,595,226
BALL AND BAT CARRIER

Elmer A. Wessel, Lincoln, Nebr., assignor to Industrial Machine Specialties, Inc., Lincoln, Nebr.

Filed Nov. 7, 1984, Ser. No. 669,098
Int. Cl.[4] B65D *19/00*
U.S. Cl. 294—146 10 Claims



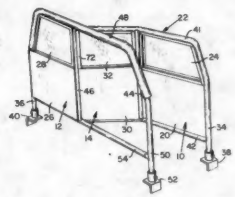
1. A ball and bat carrier comprising:
a framework at least 80 percent of which is wires welded together and having a total wire length;
the total wire length including at least one-half of wire having diameters within the range of ⅛ inch to ½ inch;
said framework including a ball holder section, a bat storage section and a bat game rack section;
said framework including two hook members extending outwardly a length of between ½ inch and 5 inches having downwardly extending portions within a range of ½ inch to 5 inches and being positioned above the center of gravity of the wire framework, whereby said ball and bat rack may be hung on a fence, for use during a game in a position that causes the game bat rack to be readily accessible;
said framework further including means serving as a handle when carrying and ending above the top of the framework in a hand grip portion and a bottom upon which the rack may rest;
said ball holder section including wire members shaped at the top end to receive a ball and having members extending downwardly to confine a stack of balls, the top having a dimension across it within the range of 1½ inches to 5 inches;
said hand grip portion of the handle being at least three inches long;
the distance between the top of the hand grip portion and the handle and the bottom of the framework being less than 36 inches and more than 12 inches;
the distance between the bottom of the hand grip portion and the top of the framework being at least three quarters of an inch.
said ball holder section having at the bottom a support to hold balls and above the support a wider portion within the range of 1½ inches to 3½ inches;
said bat storage section including means for holding bats in a horizontal position from right to left with the grip portion of the bat being supported on one end and the thickened portion of the bat on the other.

4,595,227
MOTOR VEHICLE PARTITION APPARATUS WITH LONGITUDINALLY OFFSET SECTIONS

John R. Setina, 2926 Yelm Hwy. SE., Olympia, Wash. 98501

Filed Dec. 9, 1983, Ser. No. 559,947
Int. Cl.[4] B62D *33/04*
U.S. Cl. 296—24 R 20 Claims

1. A motor vehicle partition apparatus, comprising:
a forward partition section;
a rearward partition section spaced horizontally of said forward section and spaced rearwardly of said forward section by a longitudinal offset space in a direction longitudinally of the vehicle,
means for mounting said partition apparatus with the forward partition section in the position where a removed front seat is normally located and the rearward partition section is located behind the driver's seat of the vehicle, said mounting means including first and second legs attached to the outer side edges of the forward and rearward partition sections respectively, and a third leg spaced rearwardly of said first leg by a passenger opening

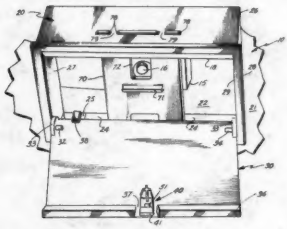


to enable a passenger to enter and exit the rear seat of the vehicle, said longitudinal offset space being less than the longitudinal distance from said rearward partition to the front of the driver's seat to provide an emergency exit space which allows the driver to exit from the driver's seat of the vehicle in front of said forward partition section;
an intermediate partition section connected between said forward section and said rearward section and extending diagonally across said longitudinal offset space; and
window means provided in at least one of said partition section.

4,595,228
GARAGE DOOR OPENING TRANSMITTER COMPARTMENT

Zooey C. Chu, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Apr. 30, 1984, Ser. No. 605,583
Int. Cl.[4] B60R *5/00*
U.S. Cl. 296—37.7 15 Claims



1. A combination of a remote control transmitter and a compartment therefor comprising:
a remote control transmitter having an actuator switch;
a housing defining a compartment with an opening for receiving said transmitter;
a door movably mounted on said housing to at least three positions including an open position in which said transmitter can be inserted and removed from said compartment, a normal closed position for covering said opening and a third position located inwardly of said normal closed position; and
actuator means coupled to said door and positioned for engaging and actuating said actuator switch of said trans-

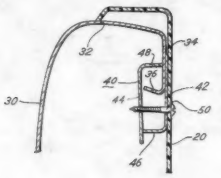
mitter when said door is closed and depressed to said third position inwardly toward said compartment; said actuator means, door and transmitter being interrelated so that when said transmitter is located in said compartment and said door is in normal closed position said actuator switch is not actuated and when said door is depressed to said third position said actuator switch is actuated.

4,595,229

COMBINATION TRUCK BED, LINER, AND SECURING STRUCTURE

James A. Wagner, Elkhart, Ind., assignor to LRV Corporation, Elkhart, Ind.

Filed Apr. 4, 1984, Ser. No. 596,670
Int. Cl.[4] B62D *33/00*
U.S. Cl. 296—39 R **10 Claims**



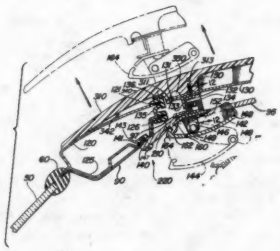
1. The combination of a truck bed having side walls with opposed upper edges and a flange extending downwardly from the upper edge, a liner for the bed having side walls positioned along side of the flanges on the bed side walls and adjacent thereto, and a plurality of fixtures slidably securing the liner side walls to the respective flanges, each fixture including a first generally L-shaped plate seated between the liner side wall and the flange on the respective truck side wall, a leg extending from said first plate towards said truck side wall and seated against a second generally L-shaped plate, a leg extending from said second plate and seated against said flange, and a screw-like means extending through the adjacent liner side wall and said first and second plate members for securing the liner side wall against said flange.

4,595,230

METHOD AND APPARATUS FOR CONVERTING A HARDTOP VEHICLE TO A REMOVABLE TOP VEHICLE

Ian J. Fettes, Newport Beach, Calif., assignors to Top Off Corp., Newport Beach, Calif.

Filed Jun. 10, 1983, Ser. No. 502,940
Int. Cl.[4] B60J *7/195*
U.S. Cl. 296—102 **37 Claims**



13. Apparatus for the conversion of hardtop vehicles to removable hardtop vehicles, wherein the hardtop may be fixed in position or removed from the vehicle and at least a portion of said hardtop is defined by a single wall structural element, and said hardtop is severed from said vehicle at front and rear joints, comprising:

joinder means adapted to seal surfaces of said vehicle which mate together when said removable hardtop is fixed in position on said vehicle;

roof cap means adapted to fit over at least a portion of said single wall structural element and said front joint and adapter to cooperate with said joinder means to mutually seal said front joint; and

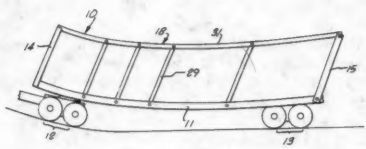
securing means for removably securing said removable hardtop to said vehicle.

4,595,231

CARGO HAULING ROAD VEHICLE

Paul F. Bennett, San Marino; James M. Warwick, Whittier, and George J. Caird, Fullerton, all of Calif., assignors to Utility Trailer Manufacturing Company, City of Industry, Calif.

Filed Jul. 21, 1982, Ser. No. 400,427
Int. Cl.[4] B62D *25/02*
U.S. Cl. 296—181 **47 Claims**



1. In a road vehicle for hauling cargo, the combination of: a generally rectangular flatbed frame having opposite ends and being subjected to deflection and longitudinal twisting in service under load, at least one longitudinal member extending over and above the level of the flatbed frame between the opposite ends of the flatbed frame, upright support means including at least two opposed wall frames spaced longitudinally of the flatbed frame and extending vertically thereof between the flatbed frame and the longitudinal member, a plurality of joints interconnecting said wall frames with said longitudinal member and said flatbed frame to define a generally rectangular structural framework of four structural members including the flatbed frame, wall frames and longitudinal member and wherein the longitudinal member is supported by the wall frames and flatbed frame, and wherein at least two of said joints each include means allowing relative angular movement about transverse axes between at least three of said structural members when the framework is subjected to loads during service, and wherein at least one of said joints is constructed to maintain the structural framework erect when subjected to loads during service.

4,595,232

PORTABLE CHAIR THAT CAN BE FOLDED INTO A COMPACT CARRYING UNIT

Holt E. Glenn, P.O. Box 497, Ayden, N.C. 28513, and Clarence F. Smith, Jr., Ayden, N.C., assignors to Holt E. Glenn, Ayden, N.C.

Filed Nov. 19, 1984, Ser. No. 672,915
Int. Cl.[4] A47C *4/28*
U.S. Cl. 297—17 **1 Claim**

1. A portable chair comprising in combination

(a) a generally rectangular seat means composed of strong and flexible sheet material that is disposed in a generally horizontal plane, and which has a front edge, a rear edge and two side edges,

(b) a spaced apart pair of elongated seat support members that engage the front edge and the rear edge of said rectangular seat means and which can serve to support said seat means in a generally horizontal plane when the chair is in its operative position,

(c) a pair of X-configured leg sections attached to the ends of said seat support members, each X-configured leg section

(1) consists of two elongated leg members that are pivotally connected to each other intermediate their ends so that the leg members can be pivoted apart in the configuration of an "X" or pivoted together into a configuration resembling an "I",

(2) having the upper ends of each leg member pivotally connected to a lateral end of a seat support member by an L-shaped pivotal connection means, each said L-shaped pivotal connection means having one pivot leg that essentially follows the line of the leg member to which it is attached and another pivot leg that is essentially perpindicular to said first pivot leg and extending outwardly therefrom, each said L-shaped pivotal connection means being pivotally connected to the sides of an end of an elongated seat support member at a point which is outwardly from the point at which said L-shaped pivot connection means is connected to said elongated leg members so that when the pairs of the elongated leg members are each pivoted together into said configuration resembling an "I", the thus I-configured pairs can be further pivoted through an angle of

270° until all of the leg members are parallel to each other and also parallel to said pair of elongated seat support members, the legs of one pair of L-shaped pivotal connection means being longer than the corresponding legs on the other pair of L-shaped pivotal connection means so that when the portable chair is in its "folded up" condition, the pairs of folded up legs will lie in immediately adjacent planes that are parallel to each other and also parallel to the immediately adjacent folded together seat support members, figured leg sections

(d) the back leg member of each pair of X-configured leg sections being provided with a receiving and supporting sockets,

(e) a generally rectangular back support means composed of strong and flexible sheet material that is disposed in a generally vertical plane and which has a top edge, a bottom edge and two side edges,

(f) a spaced apart pair of elongated post members that engage the side edges of said back support means and which serve to support said back support means in a generally vertical plane when the chair is in its operative position, the lower ends of said post members being supported by the sockets set forth in (d).

4,595,233

ACTUATING SHAFT ASSEMBLY

Charles S. Fox, 8516 Dogwood, Germantown, Tenn. 38138

Filed Jun. 18, 1984, Ser. No. 621,941

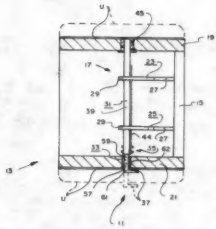
Int. Cl.[4] A47C *1/034;* **A47B** *95/02;* **G05G** *1/04*

U.S. Cl. 297—69 **5 Claims**

1. An actuating shaft assembly for use with a chair of the type including a first sidewall, a second sidewall, a footrest and a carriage mechanism for movement between extended and retracted positions and for supporting said footrest in said extended and retracted positions, said assembly comprising:

(a) first shaft means coupled to said carriage mechanism for causing said carriage mechanism to move between said extended and retracted positions when rotated, said first shaft means including a shaft member having first and second ends with said first end being rotatably mounted to said first sidewall of said chair and with said second end having at least one transverse aperture therethrough;

(b) second shaft means including a plurality of shaft members of varying lengths with each of said shaft members having first and second ends and with said first end of one of said shaft members extending through said second sidewall of said chair and being telescopically attached to said second end of said shaft member of said first shaft members for allowing said second end of said one of said shaft members of said second shaft means to be positioned a substantially constant distance outward of said second sidewall of said chair regardless of the width of said chair, said first end of each of said shaft members of said second



shaft means having a plurality of spaced apart transverse apertures therethrough, the spacing of said apertures through said first end of each of said shaft members of said second shaft means being the same for all of said shaft members of said second shaft means and being greater than the variance in length between each of said shaft members of said second shaft means;

(c) attachment means extending through at least one of said transverse apertures through said first end of said one of said shaft members of said second shaft means that extends through said second sidewall of said chair and extending through said at least one transverse aperture through said second end of said shaft member of said first shaft means and fixedly attaching said shaft members together; and

(d) handle means coupled to said second end of said one of said shaft members of said second shaft means that extends through said second sidewall of said chair for allowing the manual rotation thereof to cause said shaft member of said first shaft means to rotate and to cause said carriage mechanism to move between said extended and retracted positions.

4,595,234

ROCKING CHAIR

Jens A. Kjersem, Einarvikgaten 1, 6000 Ålesund, Norway

Filed Oct. 19, 1984, Ser. No. 662,568

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—258 **9 Claims**

1. A rocking chair with rockers wherein each rocker has a fulcrum between a forward rocker section and a rearward rocker section for rocking the chair into a forward-tilted or back-tilted position, respectively, and wherein the chair seat and backrest are connected to the forward end of the rockers via resilient arms which form acute angles relative to the rockers and whose upper, substantially horizontal parts provide support for the chair seat, wherein the rear section of the chair seat is lower than its forward section in the back tilted position of the chair, and the backrest comprises a straight, fixed, hori-

zontal body disposed at a height of less than 30 cm above the lower section of the seat, which corresponds to the height of the fifth lumbar vertebra on an adult person sitting in the chair,

the vertical thickness of said backrest body being less than 11 cm, and the forward surface of the backrest being approximately vertical when the chair has been tilted into the back-tilted position, resting on a horizontal surface.

4,595,235

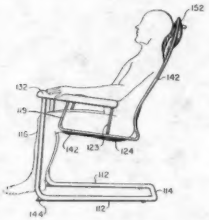
PATIENT'S DEFINED-MOTION CHAIR

Roger K. Leib, 515 S. Crocker St., Los Angeles, Calif. 90013

Continuation-in-part of Ser. No. 248,852, Mar. 30, 1981, which is a continuation-in-part of Ser. No. 110,340, Jan. 7, 1980, abandoned. This application Apr. 15, 1982, Ser. No. 368,521

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—294 **5 Claims**



1. A chair comprising a substantially rigid base and a pair of spaced substantially rigid supporting members rigidly attached to and extending upwardly from the base, the chair having seat and back members, wherein the seat and back members are rearwardly cantilevered from the tops of the supporting members, the tops of the supporting members being located above the seat member so as to achieve a natural rearwardly increasing rocking motion about a horizontal axis above the seat member in response to the weight of a person sitting in the chair.

4,595,236

ARTICULATED CHAIR WITH WEIGHT RESPONSIVE RESILIENT MEANS

Ennio Rizzoli, S. Lazzaro di Savena, Italy, assignor to Castelli S.p.A., Bologna, Italy

Filed Jul. 12, 1984, Ser. No. 630,130

Claims priority, application Italy, Jul. 12, 1983, 67756 A/83; May 17, 1984, 67495 A/84

Int. Cl.[4] A47C *1/032*

U.S. Cl. 297—316 **18 Claims**

1. A chair comprising:

a fixed base structure,

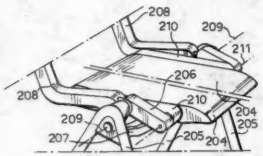
a seat support structure having a seat secured thereto,

a backrest support structure having a backrest secured thereto,

said backrest support structure being articulated to said fixed base structure about a horizontal transverse axis and moveable from a first operative position, corresponding to a substantially erect condition of the backrest, to a second operative position, corresponding to a partially-reclined condition of the backrest, as a result of a thrust exerted by the body of a seated person,

first resilient means operatively connected between said backrest support structure and said fixed base structure for biasing said backrest support structure towards its first operative position,

said seat support structure being articulated to said fixed base structure and having at least one portion which is moveable substantially vertically and independently from said backrest support structure from a raised position to a lowered position as a result of the load exerted by the body of a seated person,



second resilient means operatively connected between said moveable part of said seat support structure and said fixed structure for biasing said moveable part of said seat support structure towards its raised position so that when a person is seated upon said seat, the latter reaches a position which is dependent upon the weight of the seated person, and

means operatively connected between said moveable part of said seat support structure and said first resilient means for adjusting the load of said first resilient means, said adjusting means being responsive to the position reached by the seat immediately after a person sits thereon so that the load of the first resilient means is adjusted as a function of the weight of a seated person.

4,595,237

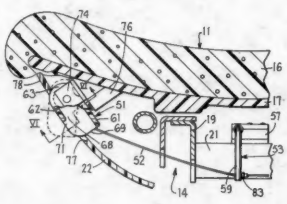
ACTUATING CONTROL FOR SEAT HEIGHT ADJUSTMENT MECHANISM

Randall P. Nelsen, Wyoming, Mich., assignor to Haworth, Inc., Holland, Mich.

Filed May 11, 1984, Ser. No. 609,399

Int. Cl.[4] A47C *3/22*

U.S. Cl. 297—347 **7 Claims**



1. In a pedestal-type chair having base and seat assemblies, the seat assembly including inner and bottom shells defining a substantially closed interior space therebetween, a frame structure positioned in said space, and a height-adjusting mechanism extending vertically and connected between said base and seat assemblies, the height-adjusting mechanism including a fluid pressure cylinder unit having telescopic upper and lower sec-

tions connected to the seat and base assemblies, respectively, said upper section having the upper end thereof positioned substantially within the seat assembly at the lower central portion of the interior thereof and being provided with an upwardly projecting valve release member which is slidably supported on and projects axially inwardly of the cylinder unit, and a manually actuated control mechanism for movably displacing the valve release member to unlock the cylinder unit when height adjustment of the seat assembly is desired, the improvement wherein said control mechanism comprises:

said bottom shell having a small opening therethrough adjacent but spaced inwardly a small distance from an outer edge thereof, said opening communicating with said interior space;

a manually engageable activating lever pivotally supported on said seat assembly within said interior space, said activating lever being positioned closely adjacent the bottom seat shell in the vicinity of said outer edge thereof and accessible solely from beneath the seat assembly;

means pivotally supporting said activating lever relative to said seat assembly and defining a pivot axis for said activating lever which is positioned in the vicinity of said outer edge;

said activating lever being normally maintained in an inactive position wherein at least a majority of the activating lever and its pivot axis are positioned interiorly of the seat assembly above the bottom shell, said activating lever having a grip portion which projects radially from said pivot axis, said grip portion extending approximately across said opening when said activating lever is in said inactive position so as to be accessible from beneath the bottom shell;

said activating lever having a drumlike portion fixed thereto in concentric relationship with said pivot axis, said drumlike portion being positioned within said interior space;

a motion-transfer lever positioned interiorly of said seat assembly within a central part of said interior space and pivotally supported relative to said interior frame structure, said motion-transfer lever having a portion thereof engaged with said valve release member for activating the latter; and

elongated flexible cable means positioned interiorly of said seat assembly and connected between said motion-transfer lever and said activating lever for transferring the motion of the activating lever to the motion-trasnfer lever so as to activate the valve release member when height adjustment is desired, said cable means being adapted to at least partially wrap around said drumlike portion in response to swinging of the activating lever into an activated position.

4,595,238

VEHICLE SEAT

H. Walther Göldner, Denkendorf, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,150

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337910

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—452 **18 Claims**

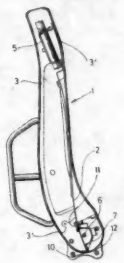
1. A backrest for a motor vehicle seat, comprising:

two longitudinal beams defining the lateral sides of the backrest;

a thin plate rigidly connected to the two longitudinal beams at spaced points along each of the lateral edge areas of the plate;

said backrest being pivotable relative to the seat about a lateral axis; and

said plate having a reinforcing element in an end section adjacent the lateral axis which extends in the lateral direction of the backrest, said reinforcing element being formed



as a cover for the lateral axis, said lateral axis lying between the cover and said plate.

4,595,239

OIL RECOVERY MINING APPARATUS

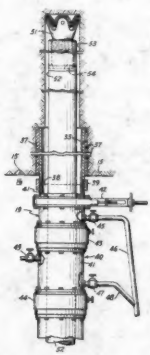
Maynard F. Ayler, Golden, and George Vranesh, Boulder, both of Colo., assignors to Oil Mining Corporation, Golden, Colo.

Division of Ser. No. 307,650, Oct. 1, 1981, Pat. No. 4,458,945.

This application Mar. 23, 1984, Ser. No. 592,409

Int. Cl.[4] E21B *33/03, 33/13*

U.S. Cl. 299—2 **5 Claims**



1. A fluid and cuttings control assembly for gravity-type drain oil wells used in oil well mining comprising a stop valve mounted on a drainage oil well pipe casement for securement to a firmly anchored collar pipe providing the outer linear for an access opening to a gravity-type drainage oil well, said stop valve and pipe casement having an inside diameter opening with said stop valve in the open condition sufficient to accommodate the outside diameter of a gravity-type drainage oil well production conductor pipe and drill string-together with appended stop valves, couplings and the like, upper and lower blow-out preventers secured to said casement below said stop valve and having internal diameters while open sufficient to accommodate the external diameter of the gravity-type drainage oil well production conductor pipe and drill string together with fittings, an upper drain vent control valve located in a first drain vent branch pipeline connected to an opening in said casement located between the stop valve and above the upper blow-out preventer for venting the space within said casement between the stop valve and the upper blow-out preventer with the upper blow-out preventer in the closed blow-out preventing condition, and a lower drain vent control

valve located in a second drain vent branch pipeline connected to an opening in the casement located intermediate the upper and lower blow-out preventers for venting the space within said casement between said upper and lower blow-out preventers with the upper and lower blow-out preventers in the closed blow-out preventing condition whereby during drilling the first drain vent branch pipeline provides means for removal of drilling fluids, fluids produced, and cuttings to a closed pipeline removal system, the second drain vent branch pipeline provides means for removal of any fluids or cuttings that may pass through the upper blow-out preventer, and during insertion of the production conductor pipe, preparatory to cementing, the first and second drain vent branch pipelines function for removal of any fluids that have been produced from the overlying reservoir: and wherein the lower drain vent control valve connection to the casement is located above the lower blow-out preventer and immediately adjacent thereto and a third drain vent control valve is provided in a third drain vent branch pipeline connected to an opening in the common casement between the upper and lower blow-out preventers and located at a point immediately below and adjacent to the upper blow-out preventer for selectively venting the space in said casement between said upper and lower blow-out preventers while it is being filled with a fluid supplied through said lower drain vent control valve whereby during cementing of a production conductor pipe in place, fluid under pressure completely fills the space between the two blow-out preventers to prevent leakage of cement into this space during the cementing.

4,595,240

COMBINED BUCKET AND FROZEN SOIL SCARIFIER

Stig Pettersson, Iggesund, Sweden, assignor to Logos Export AB, Hudiksvall, Sweden

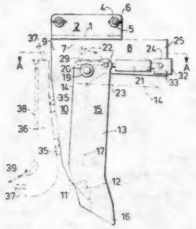
PCT No. PCT/SE82/00179, § 371 Date Jan. 17, 1983, § 102(e) Date Jan. 17, 1983, PCT Pub. No. WO82/04085, PCT Pub. Date Nov. 25, 1982

PCT Filed May 18, 1982, Ser. No. 460,241

Claims priority, application Sweden, May 21, 1981, 8103229; Jul. 6, 1981, 8104199

Int. Cl.⁴ E02F *5/32*

U.S. Cl. 299—24 **15 Claims**



1. A device providing a combined bucket and frozen soil scarifier (cable plough), where the bucket and the scarifier are intended to be attached to a digger arm of an excavator or corresponding machine and the width of the scarifier is substantially smaller than the width of the bucket, and the bucket in digging position rests at its rear edge against the scarifier, and at its upper portion is hingedly suspended by means of an axle or corresponding member, and by preferably hydraulic means, for example at least one hydraulic cylinder, can be folded in the direction from the scarifier, whereby the scarifier can be used without the bucket being engaged, characterized in that a common attachment (1–6, 43, 44) for the scarifier (10) and the bucket (13) provided and arranged, preferably by means of a quick-coupling arrangement (3–6) for attaching the bucket (13) and the scarifier to the digger arm as a unit, the scarifier (10) being rigidly attached to said attachment (1–6, 43, 44), and that two hydraulic cylinders (21) are provided, one on each side of an attachment piece (8) provided at the upper portion of the scarifier (1), each cylinder (21) acting between the attachment piece (8) and an attachment (22) in connection with the forward edge (23) of the bucket (13), so that the bucket (13) can be folded by means of the cylinders (21) between a first position, digging position, where the bucket rests against the scarifier (10), and a second position, folded-up position, where the bucket (13) has been rotated about the axle (19) and been moved forward and upward, so that the scarifier (10) is exposed, the bucket being foldable to any position between said first and second positions by means of the cylinders (21), and that the lower edge (14) of the bucket (13) in folded-down position, digging position, is located in connection to the lower edge (11, 12) of the scarifier (10) whereby the scarifier (10) and the bucket (13) are designed so that single objects, for example a log or a stone, can be gripped by co-action between the scarifier (10) and the bucket (13).

4,595,241

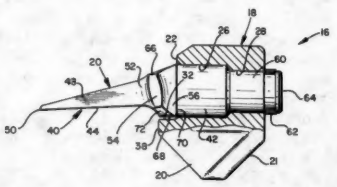
DIGGING TOOTH AND HOLDER THEREFOR

Jerry F. Gilbert; Jonathan J. Gilbert, and Albert J. Gilbert, all of 3549 Bedford St., Dallas, Tex. 75212

Filed Apr. 16, 1984, Ser. No. 600,353

Int. Cl.⁴ E21C *35/18*

U.S. Cl. 299—93 **8 Claims**



1. A non-rotatable digging tooth of the type having a substantially flat ground engaging working end opposed to a cylindrical shank located on the opposed end, with said shank part being of a configuration to be removably received within a cylindrical smooth bore of a support box; the combinations of said tooth and box comprising:

said box has a bottom part for attachment to a digging machine; said box has means forming an outwardly extending shoulder extending forwardly of said bore and located in a plane which is parallel to the axis of the bore;

said tooth is of unitary construction and includes a medial part made into a tooth shoulder which lies parallel to the axis of said shank;

said tooth shoulder is placed in confronting relationship respective to the box shoulder when the tooth shank is received within the bore of the support box so that the confronting faces abuttingly engage one another and thereby prevent axial rotation of the tooth.

4,595,242

REAR HUB SHELL FOR BICYCLES AND METHOD OF MANUFACTURING SAME

Gerhard Wehmeyer, Werther, Fed. Rep. of Germany, assignor to Weco Wehmeyer & Co. Fahrzeug-Fahrzeugteile-Werke GmbH & Co., Werther, Fed. Rep. of Germany

Filed Aug. 23, 1984, Ser. No. 643,917

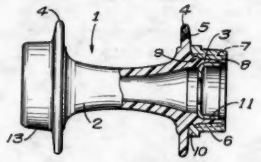
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331142

Int. Cl.⁴ B60B *5/02*

U.S. Cl. 301—6 V **9 Claims**

1. A rear hub shell for a bicycle, comprising a one-piece body made of plastic and having a spoke flange and a hub head on both ends thereof, a metal ring with a fine outside thread

and means positively and externally connecting the ring to at least one of the hub heads to prevent rotation and axial displacement of the ring relative to the hub head, said means



including an annular recess on the inner surface of the ring in the vicinity of the spoke flange and filled with the material of the hub head.

4,595,243

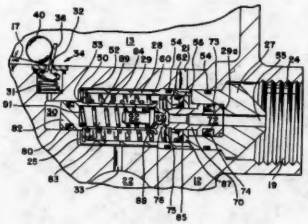
DECELERATION AND PRESSURE SENSITIVE PROPORTIONING VALVE

Robert F. Gaiser, Stevensville, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Sep. 10, 1984, Ser. No. 649,244

Int. Cl.[4] B60T *17/04*

U.S. Cl. 303—6 C **65 Claims**



1. In an incompressible fluid proportioning valve assembly for a vehicle having an inlet communicating with a fluid pressure source and an outlet communicating with a brake assembly, an incompressible fluid pressure responsive assembly cooperating with the inlet and the outlet to vary fluid communication therebetween in response to pressurized fluid communicated to the inlet, and an inertia sensing mass responsive to deceleration of the vehicle and cooperating with the incompressible fluid pressure responsive assembly to assist in the variation of fluid communication between the inlet and outlet, the improvement comprising a channel communicating with the pressure responsive assembly and a fluid reservoir, and valve means disposed in said channel and engaged by said inertia sensing mass, the inertia sensing mass being responsive to deceleration of the vehicle to effect operation of said valve means to prevent fluid communication with the reservoir through the channel and thereby cooperate with the pressure responsive assembly in the variance of fluid communicated to said outlet.

4,595,244

RECIRCULATING-BALL LINEAR BEARING

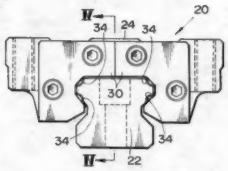
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 461,126, Jan. 26, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,924

Claims priority, application Japan, Feb. 13, 1982, 57-21480; Feb. 13, 1982, 57-21481

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—15 **9 Claims**



1. A recirculating-ball linear bearing capable of withstanding the load acting thereon in four orthogonal directions, comprising:

(a) a body of substantially inverted-U-shaped cross section having two opposed pairs of raceways of arcuate cross section formed longitudinally on inner surfaces thereof, each pair of raceways being vertically spaced from and angled toward each other, the body also having a return passageway formed longitudinally therethough in the vicinity of each raceway, the body comprising a bridge portion and a pair of aprons depending from its opposite sides, and wherein the aprons have a sufficient thickness to have the return passageways formed therethough without suffering a substantial decrease in strength or rigidity;

(b) a pair of end covers secured to the opposite ends of the body, each end covering being of substantially the same shape and size as the cross section of the body and being segmented into a pair of lateral halves, each half of each end cover having formed therein two hairpin passageways each inter-communicating one raceway and one adjacent return passageway in the body, each half of each end cover also having a retainer groove formed therein;

(c) a group of recirculating antifriction balls capable of rolling along each raceway and through one adjacent return passageway communicated therewith via the hairpin passageways, each raceway on the body being, as viewed cross-sectionally, curved with a radius approximately equal to the radius of each antifriction ball, and wherein the planes passing the longitudinal median lines of the raceways and the centers of the antifriction balls thereon are angularly spaced 90 degrees from each other, the return passageways associated with each pair of raceways on the body being disposed inwardly of the planes passing the longitudinal median lines of the raceways and the centers of the antifriction balls thereon so as to reduce the vertical dimension of the body, each of said two hairpin passageways in each end cover being curved away from the assocated raceway toward the associated return passageway while departing gradually away from the planes passing the longitudinal median lines of the raceways and the centers of the antifriction balls thereon; and

(d) a pair of cages extending along one pair of raceways on the body for rollably holding the antifriction balls thereon and supported in position by having the opposite ends thereof closely engaged in the retainer grooves in the pair of end covers, each cage being in the form of a strip of rigid material bent substantially into the shape of a V in cross section to provide a pair of divergent web portion of each cage having formed therein a slot extending along one raceway on the body having width less than the diameter of each antifriction ball to allow the antifriction

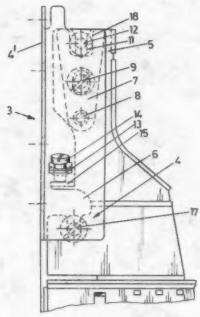
balls to partly project inwardly therethrough as they roll along the raceway.

4,595,245

FASTENING DEVICE FOR FRONT PLATES OF DRAWERS OR THE LIKE

Erich Röck, and Josef Brunner, both of Höchst, Austria, assignors to Julius Blum Gesellschaft mbH, Höchst, Austria

Filed Jun. 26, 1984, Ser. No. 624,966
Claims priority, application Austria, Jul. 19, 1983, 2638/83
Int. Cl.[4] F16B *12/00*
U.S. Cl. 312—330 R **9 Claims**



1. A fastening device for use on opposite sides of an extractable furniture element for adjustably mounting a front plate on the furniture element, said fastening device comprising:

a supporting part adapted to be mounted on a front portion of the furniture element;

a holding part adapted to be mounted on the front plate;

means for connecting a lower portion of said holding part to a lower portion of said supporting part and to enable relative pivoting therebetween about a first axis extending parallel to the plane of the front plate;

a flap member mounted on said supporting member for pivotal movement relative thereto about a second axis extending parallel to the plane of the front plate, said flap member extending perpendicular to the plane of the front plate;

an adjusting member mounted between said supporting part and said flap member for selectively pivoting said flap member about said second axis;

an upper bolt having a longitudinal axis extending parallel to the plane of the front plate for connecting an upper portion of said holding part to an upper portion of said supporting part; and

means for, upon operation of said adjusting member to pivot said flap member about said second axis, pivoting said holding member and thereby the front plate about said first axis, and thereby adjusting the inclination of the front plate relative to the furniture element.

4,595,246

INTERLOCKING SPACER SYSTEM

Elly Bross, Montreal, Canada, assignor to The Stanbel Group, Montreal, Canada

Filed Sep. 13, 1984, Ser. No. 650,068
Int. Cl.[4] A47B *87/00*; B65D *1/24*
U.S. Cl. 312—330 R **7 Claims**

1. An interlocking spacer system for use in dividing an area into a number of smaller compartments comprising:

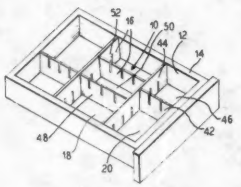
a plurality of panels,

said panels each comprising a plurality of wall segments joined together in a linear arrangement by webs,

said wall segments comprising rectangular planar members and said web connections occuring along the height of said wall segments,

said webs having a first end closely adjacent a first end of two adjacent wall segments and a second end approximately half way along the height of said wall segments,

said webs further having two pairs of opposed grooves, a first pair being sharp and deep, facilitating separation of said two adjacent wall segments along said grooves, said second pair being wide and shallow to receive a pair of



opposed side walls of an adjacent pair of wall segments of another panel,

said panels including a web-like protrusion at at least one end thereof, each with a single pair of opposed grooves identical to said wide and shallow grooves to permit one of said panels to be interlocked with another of said panels in an end butt arrangement,

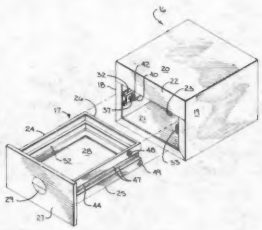
whereby said panels interlock by means of said opposed side walls engaging said second pair of grooves.

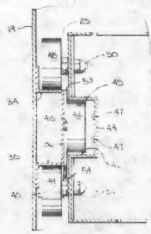
4,595,247

FOOD CABINET DRAWER SUPPORT

Jeffrey T. Zank, Milwaukee, Wis., assignor to Alto-Shaam, Inc., Menomonee Falls, Wis.

Filed Dec. 7, 1983, Ser. No. 558,819
Int. Cl.[4] A47B *88/00*; F16C *21/00*
U.S. Cl. 312—343 **6 Claims**





1. In combination, a cabinet having a pair of opposite side walls and an open front, a drawer slidably received within said cabinet and movable between open and closed positions, said drawer including a frame having a pair of opposite side walls

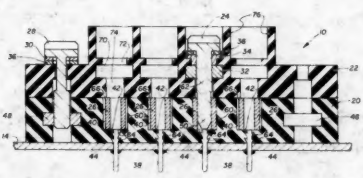
disposed substantially parallel to the side walls of said cabinet, and a drawer support for effecting the sliding movement of said drawer, said support includes a channel-shaped drawer slide mounted on each cabinet side wall and extending along substantially the entire length of said cabinet side wall, said drawer slide includes an upper L-shaped guide rail, a lower L-shaped guide rail and a web portion spaced from said cabinet side walls and extending parallel thereto interconnecting the upper and lower guide rails of said slide, said upper and lower slide guide rails forming respective upper and lower rolling surfaces on said drawer slide; a slide roller mounted on the web portion of said drawer slide and rotatable about an axis extending normal to said cabinet side wall; a U-shaped drawer runner mounted on each drawer side wall and extending along substantially the entire length of said drawer side walls, said drawer runner includes an upper guide rail, a lower guide rail, said upper and lower runner guide rails forming respective upper and lower rolling surfaces which act as bearing surfaces for said slide roller and extending the length of said runner parallel to and adjacent to said slide for receiving said slide roller therein; upper and lower spaced apart drawer rollers mounted on the drawer side walls above and below said runner respectively and each rotatable about an axis extending normal to said drawer side wall and each engageable with the respective upper and lower rolling surfaces of said drawer slide, wherein said upper and lower drawer rollers and the guide rails of said drawer slide are disposed in substantially vertical alignment outside said drawer side walls and said slide roller and the guide rails of said drawer runner are disposed in substantially vertical alignment at a location inside said drawer side walls; and retainer means on the web portion of said drawer slide for preventing excessive lateral movement of one of said drawer roller when said drawer is in its open position.

4,595,248

TERMINAL BLOCK

James C. Brown, 9923 Neil Armstrong Ct., Fort Wayne, Ind. 46804

Filed Apr. 21, 1983, Ser. No. 487,448
Int. Cl.[4] H01R *9/09, 9/18, 9/24*
U.S. Cl. 339—17 LC **9 Claims**



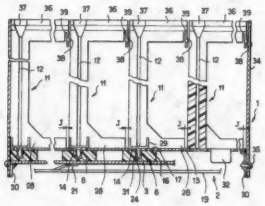
1. A terminal block for connecting a printed circuit board containing a first series of electrical conductors to a second series of electrical conductors, said terminal block comprising: a base block, a cap block disposed on said base block, a plurality of cap contacts removably secured to said cap block, said cap contacts being electrically and mechanically isolated from each other, a plurality of base contacts secured to said base block, said base contacts being electrically and mechanically isolated from each other, said base contacts being in electrical contact with said cap contacts on a one-to-one basis when said cap block is disposed on said base block, means is addition to said contacts extending between said cap and base blocks for preventing said cap and base blocks from unintentionally separating, said cap and base contacts being mechanically and electrically isolated from said preventing means, means for electrically connecting said base contacts to said printed circuit board conductors on a one-to-one basis, means for removably electrically connecting said cap contacts to said second series of electrical conductors on a one-to-one basis, whereby said terminal block provides an interface between said printed circuit board and said second series conductors with said cap and base blocks being accessible to maintain, repair, and replace independently of each other.

4,595,249

RECEPTACLE FOR ELECTRONIC CARDS AND METHOD OF ASSEMBLING THE SAME

Yves Oehlert, Rueil; Jean Neyroud, Domene, and Jean Joly, Houilles, all of France, assignors to La Telemecanique Electrique, Nanterre, France

PCT No. PCT/FR84/00101, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/04224, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 11, 1984, Ser. No. 689,041
Claims priority, application France, Apr. 15, 1983, 83 06174
Int. Cl.[4] H05K *1/14*
U.S. Cl. 339—17 LM **20 Claims**



1. A card receptacle for removably receiving input-output cards and making connections between them and a printed circuit board, said card receptacle comprising:

a container (1) carrying in a bottom region thereof the printed circuit board (3), the latter being subject to thermal expansion and contraction and guided for displacement in its own plane with respect to the container (1) due to such expansion and contraction, the printed circuit board carrying towards the interior of the container connectors (8) each providing a row of electrical connections;

slides (11) aligned side by side in two rows extending transverse to the rows of electrical connections, said slides being adapted to removably receive and guide two opposed edges of input-output cards (6) having on a third of their edges pins (7) insertable into the connectors (8); and

retaining means (26, 32, 33, 41) for retaining one foot of each slide (11) against displacement parallel to the rows of connections and displacement transverse to the printed circuit board (3);

the adjacent feet of the slides having play between them and being mounted so as to be laterally displaceable with respect to one another.

4,595,250

MODULAR APPARATUS FOR CODED INTERCONNECTION BETWEEN ELECTRONIC CARDS AND A PRINTED CIRCUIT BOARD

Jean Joly, Houilles, and Yves Oehlert, Rueil, both of France, assignors to La Telemecanique Electrique, Nanterre, France

PCT No. PCT/FR84/00100, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/04209, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 11, 1984, Ser. No. 691,520
Claims priority, application France, Apr. 15, 1983, 83 06176
Int. Cl.[4] H01R *9/09, 13/64*
U.S. Cl. 339—17 LM **15 Claims**

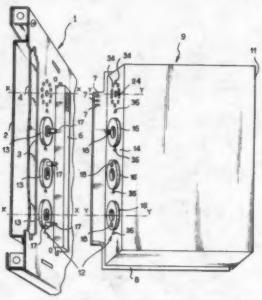
1. A card receptacle for removably receiving electronic cards and making connections between them and a printed circuit board, said card receptacle comprising:

a container carrying behind an inner bottom wall (3) thereof a said printed circuit board (4), said printed circuit board

carrying connectors (6) extending from the printed circuit board through apertures in said inner bottom wall, said connectors (6) each providing a row of electrical connections within insulative housing blocks that extend through said apertures:

electronic cards (8) in the container carrying on one edge thereof contacts (7) insertable into the connectors (6);

coding devices, each comprising at least one first coding member (13) carried by said inner bottom wall adjacent a respective one of said connectors and directly between a



pair of said apertures and at least one second coding member (16) operatively attached to a corresponding one of said electronic cards; and

means mounting at least some of the first coding members (13) displaceably relative to the inner wall (3) between a series of positions, in each of which they can be fitted together with the second coding members (16) coded by means of a corresponding positioning relative to the cards (8) to which they are attached when the contacts of the cards are inserted in the rows of connections.

4,595,251

COUPLING MECHANISM FOR CONNECTORS

Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 1, 1985, Ser. No. 697,368
Int. Cl.[4] H01R *25/00*
U.S. Cl. 339—47 R **59 Claims**

1. A hermaphroditic coupling mechanism comprising in combination:

(a) a core;

(b) a coupling ring mounted for rotation about said core;

(c) means on said core and said ring to stop rotation of said ring relative to said core in a first direction;

(d) means coupled between said coupling ring and said core to resiliently bias said ring against rotation relative to said core in the opposite direction;

(e) keying means on said core extending beyond the front end of said coupling ring and configured to anti-rotationally interlock with the corresponding means of an identical coupling mechanism when said coupling mechanisms are engaged to be mated; and

(f) a plurality of thread segments at the front end of said coupling ring,

(1) each said thread segment having first and second camming ramp surfaces facing toward the front end and the rear end of said coupling ring, respectively,

(2) the thread segments of a given one of said coupling mechanisms being configured so that when said coupling mechanism is engaged with its identical counterpart under a force linearly urging said coupling mechanisms toward each other and their keying means interlock, their first camming ramp surfaces abut and said linear force is translated thereby into a rotational force tending to turn each said ring in said first direction relative to its core against its stop means,

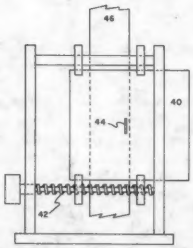
(3) whereby engagement of said coupling mechanisms by linear force along is prevented, and engagement of said coupling mechanism with its identical couterpart is made possible only by twisting at least one of said coupling rings in said opposite direction relative to its core against the force of said biasing means until the threads of one coupling ring clear the threads of the other coupling ring, at which point, under the urging of said linear force, the respective threads of said coupling rings move past each other axially so that, when said coupling ring is released, it is turned in said first direction by its biasing means, causing the threads of the respective coupling rings to engage along their second camming ramp surfaces, and said rings to move toward each other axially by the camming action of said second cammlng ramp surfaces.

4,595,252

HOLOGRAM IMAGING SYSTEM AND RECORDING METHOD

John M. Lorimer, 128 E. Drummond, Glendale Heights, Ill. 60139

Continuation-in-part of Ser. No. 383,809, Jun. 1, 1982, abandoned. This application May 6, 1985, Ser. No. 730,510
Int. Cl.[4] G03H *1/02*
U.S. Cl. 350—3.79 **4 Claims**



1. An improved hologram imaging system comprising a length of film strip, a plurality of frames in sequential order spaced along the length of said film strip, wherein each of said frames is comprised of a plurality of horizontally aligned vertica! parallel hologram strips adjacently positioned across the width of said film.

4,595,253

PARALLEL-TO-SERIAL CONVERSION OF OPTICAL DATA USING ACOUSTO-OPTICAL DIFFRACTION

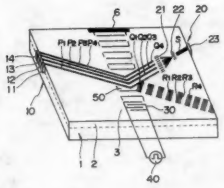
Tsukasa Yamashita, Nara; Masaharu Matano, Kyoto; Kazuhiko Mori, Osaka, and Norihiro Ota, Kamifukuoka, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 349,685, Feb. 17, 1982, abandoned. This application Mar. 27, 1985, Ser. No. 716,605

Claims priority, application Japan, Feb. 18, 1981, 56-22664; Mar. 24, 1981, 56-42870

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.13 **15 Claims**



1. A parallel-serial converter for optical data conversion, which comprises:

a thin film optical waveguide formed on the surface of a substrate;

surface acoustic wave generating means for propagating a surface acoustic wave on said thin film optical waveguide;

light incident means for propagating a plurality of incident light beams in the above described thin film optical waveguide parallelly with a prescribed interval placed so as to obtain the Bragg angle with the wave face of the above described surface acoustic wave;

driving means for driving said surface acoustic wave generating means to generate said surface acoustic wave; and

light output means for receiving and outputting diffraction light Bragg diffracted by the above described surface acoustic wave,

wherein with the progress of the above described surface acoustic wave the above described plurality of incident light beams are successively guided to the above described light output means and output in a serial state.

4,595,254

OPTICAL FIBER COLLIMATING SYSTEM

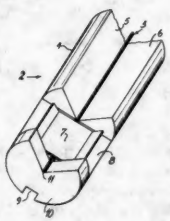
Alain Gentric, 27 Lotissement de Kéranroux, Ploubezre, 22300 Lannion, France

Filed May 23, 1983, Ser. No. 497,211

Claims priority, application France, May 28, 1982, 82 09372

Int. Cl.[4] G02B *6/36, 6/32*

U.S. Cl. 350—96.18 **8 Claims**



1. An optical fibre system comprising (A) a collimator for optical fibres, the collimator including an optical fibre having a longitudinal axis;

holding means for said optical fibre, said holding means being elongated and comprising a V-shaped recess which is formed in the lengthwise direction of said holding means and at the bottom of which the optical fibre is held in parallel alignment with said recess, said recess terminating at one end of the holding means;

an optical means which is on one hand able to transform a light beam coming out of the corresponding end of the optical fibre when injected into the other end from a light source, into a substantially parallel light beam, the optical means facing said end with its optical axis parallel to the longitudinal axis of the fibre maintained in the recess, and which is on the other hand fixed with respect to the holding means, the holding means and the optical means being previously positioned relative to one another so as to minimize, at a given distance from the optical means, the cross-section of said light beam from the optical fibre and which is transformed by said optical means; and

a support adapted to fit into the said recess, said support having surfaces complementary to the recess for abutment therewith along planes parallel to said lengthwise direction so that the holding means is aligned to this support, thus making it possible to control the direction of the light beam from the optical fibre which is transformed by the optical means.

4,595,255

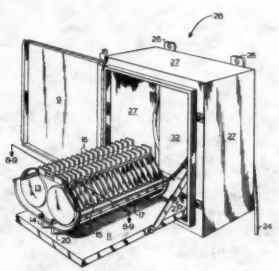
OPTICAL FIBER WIRING CENTER

Vipul J. Bhatt Sevalia, Gujarat States, India; Alan B. Mann, and Stanley S. Coe; both of Raleigh, N.C., assignors to FiberLAN, Inc., Raleigh. N.C.

Filed Aug. 24, 1983, Ser. No. 526,082

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **13 Claims**



3. An optical fiber wiring center comprising:

(a) a base member;

(b) an optical fiber receiving means having top and bottom portions, said bottom portion attached essentially parallel to and spaced apart from said base member, said receiving means containing first and second parallel rows of individual open top cavities thereon, any given cavity in the first row being essentially co-planar with one of the cavities in the second row and in communication with a part of the top portion;

(c) a splice holding means disposed on the top portion of the optical fiber receiving means between co-planar cavities; and

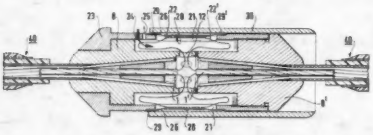
(d) an open top container movably attached to the base member.

4,595,256

CONNECTION BETWEEN THE ENDS OF TWO UNDERSEA OPTICAL FIBER CABLES AND METHOD OF MANUFACTURING SAID CONNECTION

Lucien Guazzo, Calais, France, assignor to Les Cables de Lyon, Clichy, France

Filed Apr. 5, 1983, Ser. No. 482,358
Claims priority, application France, Apr. 8, 1982, 82 06152
Int. Cl.[4] G02B *6/38*; H02G *3/00*
U.S. Cl. 350—96.21 **12 Claims**



1. A connection for connecting the ends of two submerged optical fiber cables, each cable comprising an optical fiber core housing a plurality of optical fibers, over which an arch of steel wires is helically wound, a conductive metal tube swaged down on the arch and an insulating sheath, said connection comprising at each cable end:

(a) a fixing part which is at least partially made of a metal having high mechanical strength, said fixing part having a bore which includes a conical portion at its end facing the end of the other cable and a cylindrical portion at its opposite end, said cylinrical portion accommodating the swaged down tube and said conical portion receiving the ends of the steel wire;

(b) a conical wedge splaying out the arch-forming steel wires and jamming them in the conical portion of the bore, said wedge having an axial passage which accommodates the optical core;

(c) a hardened synthetic resin plug filling the free space between the surface of the fixing part bore and the outer surface of the conical ring and surrounding the ends of said arch-forming wires and embedding the ends of said arch-forming wires and said conical ring in hardened resin and effecting a high-strength mechanical connection between said steel wires and said fixing part;

the improvement comprising at least one of the fixing parts having first radial ports longitudinally beyond said resin plug towards the end of the other cable, through which optical fibers pass out radially from the cable axis to facilitate connections between optical fibers passing out said radial ports around the fixing parts;

(d) an inner tube made of a material having high mechanical strength and forming a central portion provided with second radial ports'

(e) a welded sleeve fixed to said inner tube and positioned on each second port of the inner tube, each weld sleeve serving to connect a pair of optical fibers together; and

(f) an outer tube covering the inner tube.

8. In a method of manufacturing a connection for connecting the ends of two submerged optical fiber cables, wherein each cable comprises an optical fiber core housing a plurality of optical fibers, over which an arch of steel wires is helically wound, a conductive metal tube swaged down on the arch and an insulating sheath, said method comprising the steps of:

(a) stripping the optical cores and the arch-forming steel wires, the swaged conductive tubes and the insulating sheaths from the connection zone along a very much longer length than that occupied by the final connection, leaving the optical fibers bare;

(b) threading an outer sleeve, an inner tube and a fixing part in that order onto one end of the cable and threading the outer sleeve, the outer tube and a fixing part in that order onto the other end of the cable;

(c) cutting the arch-forming steel wires, the tubes and the insulating sheaths to a length required for the connection;

(d) splaying out the ends of the arch-forming steel wires inside said conical portions and inserting the wedges to maintain the steel wires splayed out;

(e) filling a hardenable synthetic resin in the conical portions of the bores through the fixing parts and filing the entire volume between the ends of the arch-forming steel wires and the wedges with said hardenable synthetic resin and hardening the same;

the improvement wherein at least one of said fixing parts includes at the end proximate to the other fixing part a plurality of first radial ports and wherein said inner tube includes a plurality of second radial ports and a filling orifice and a venting orifice therein, and said method further comprises the steps of:

(f) passing the optical fibers out through said first radial ports formed in said at least one of said fixing parts;

(g) locating the inner tube over the two fixing parts and screwing it onto at least one of said fixing parts to effect a mechanical connection therebetween;

(h) passing the optical fibers through said second radial ports provided within the inner tube;

(i) welding the optical fibers one-to-one and fixing sleeves on the optical fiber welds for protecting the welds and fixing said sleeves on support threads by tapes;

(j) placing each support thread in an outer groove in the inner tube such that each sleeve is hammock slung across a second port of said inner tube;

(k) sliding the outer tube longitudinally up to said filling orifice and said venting orifice for communicating with the outside air provided within the inner tube; and

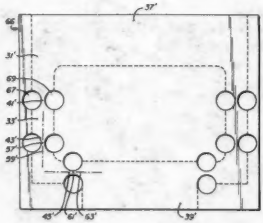
(l) filling the free space inside the outer tube with a viscous substance through said filling orifice and then sliding said outer tube over said inner tube to completely seal said orifice and permanently installing and making fast the outer tube.

4,595,257

SUPPORT MECHANISM UTILIZING FLEXUAL PIVOTS

David G. Fladlien, Los Gatos, Calif., assignor to ITP, Inc., Sunnyvale, Calif.

Filed May 18, 1983, Ser. No. 495,618
Int. Cl.[4] G02B *7/04*; F16F *1/00*
U.S. Cl. 350—255 **2 Claims**



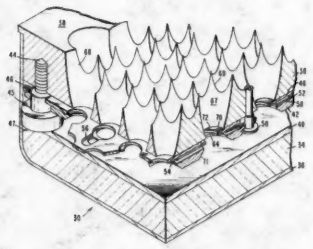
1. A mechanism supporting a first member with respect to a second member in a manner permitting smooth and controllable motion therebetween over a small distance, comprising a pair of supports connected to said members at spaced apart locations, each of said supports including three flexual pivots therealong, two oriented in a direction extending between said members and the other extending in a direction substantially orthogonal thereto, whereby said first and second members maintain a parallel relationship with each other and ends of said supports remain straight as the members are moved over said small distance.

4,595,258

SHUTTER FOR RADIATION SOURCE OF EXTENDED AREA

George W. LeCompte, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 6, 1983, Ser. No. 514,212
Int. Cl.[4] G02B *26/02*; G03B *9/36*
U.S. Cl. 350—272 **1 Claim**



1. A shutter for selectively passing and blanking the radiant energy from an extended area source radiating energy in a first direction, said shutter being positioned adjacent said source in the first direction, said shutter comprising:

an outer optical plate having a forward and a rearward surface and having a plurality of openings therethrough, each of said openings being a portion of a parabolic surface of revolution diverging in said first direction and spaced sufficiently close to one another such that the walls of adjacent openings intersect each other between the forward and rearward surfaces of said outer optical plate and such that the intersections form a hexagonal pattern and the rearward aperture of said openings is comprised of a set of six arcuate edges, and the rearward surface of said outer optical element opposite said openings is comprised of a plurality of substantially point sized areas; and

a shutter plate positioned between said outer optical plate and said source, said shutter plate having a plurality of openings therethrough, said shutter plate being movably mounted so that in a first position of said shutter plate with respect to said outer optical plate said holes in said shutter plate and in said outer optical plate are in substantial alignment and in a second position of said shutter plate with respect to said outer optical plate, said holes are out of alignment to substantially blank transmission of radiation from said source through said shutter.

4,595,259

TRANSIENT STATE LIQUID CRYSTAL IMAGE BAR FOR ELECTROPHOTOGRAPHIC PRINTERS

Alain E. Perregaux, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 19, 1984, Ser. No. 572,023
Int. Cl.[4] G02F *1/133, 1/137*
U.S. Cl. 350—331 R **14 Claims**

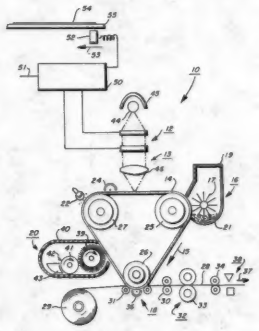
1. An improved liquid crystal image bar for an electrophotographic printer of the type having a moving photoconductive member, means for pre-charging the photoconductive member prior to the formation of latent electrostatic images, means for developing the latent images with toner particles, means for transferring the developed images to permanent record sheets, means for fusing the developed images to the record sheets and means for cleaning the photoconductive member before it is pre-charged, the image bar containing a single array of dot shutters which selectively pass light in response to digitized data signals, during the operating mode of the printer, in order to discharge selectively the pre-charged photoconductive member and thus form the latent images on the photoconductive member one line at a time, the improved liquid crystal image bar comprising:

a nematic liquid crystal material having a positive dielectric anisotropy and having parameters which enable a decay time (τd) on the order of one millisecond or less for the image bar to reach a first maximum transmission condition during its transient state;

first and second parallel, elongated transparent substrates for holding the liquid crystal material therebetween, each substrate having inner and outer surfaces, the inner surfaces confronting each other and being spaced a predetermined distance from each other with the liquid crystal material sandwiched between said inner surfaces;

at least one transparent electrode being located on the inner surface of the first substrate and a predetermined, equally spaced plurality of transparent mutually parallel electrodes being located on the inner surface of the second substrate, the electrodes on the second substrate being approximately perpendicular to the electrode on the first substrate, the electrodes and the liquid crystal material forming the single array of dot shutters;

a transparent film being coated over the inner surfaces of the substrates and electrodes thereon, the film surfaces opposite the ones contacting the electrodes confront each other and contact the liquid crystal material, the confronting film surfaces that contact the liquid crystal material having parallel micro-grooves prepared therein to cause the



molecules of the liquid crystal material to lie substantially parallel to the grooves, the substrates, and one another, without bend or twist, while in the stable de-energized or rest state;

polarizers being positioned on each of the outer surfaces of the substrates parallel to each other, the polarizers being crossed with respect to each other and oriented at about 45 degrees with respect to the main axes of the liquid crystal molecules in their rest state;

an illuminating means for directing light towards a one of the polarizers from a location spaced therefrom;

an alternating current voltage source;

means for energizing the plurality of electrodes on the second substrate with a voltage from the voltage source, the energization of the plurality of electrodes producing an electric field between said plurality of electrodes and said one electrode on the first substrate, which is generally grounded, in order to place the liquid crystal molecules in an energized or electrically driven state, whereby the polarized light entering the liquid crystal material through one polarizer is transmitted through the liquid crystal material unperturbed and the other crossed polarizer blocks the polarized light, so that image bar prevents the light from impinging on the photoconductor member when the liquid crystal molecules are in the electrically driven state; and

means for de-energizing selected ones of the plurality of

electrodes on said second substrate for a predetermined time period that is substantially equal to the decay time (τ_d) of the liquid crystal material followed by immediate energization thereof in response to receipt of digitized data signals, de-energization of each selected electrode for the predetermined time period followed by energization thereof being a cycle which places the liquid crystal material in the transient state for a sufficient time period to enable the image bar to reach substantially the first maximum transmission condition and cause a momentary passage of light through the image bar in the area covered by said cycled electrode, the momentarily passed light being a burst of light which impinges on the moving photoconductive member to discharge a precharged region on the photoconductive member representing a pixel thereon, thus, forming a latent electrostatic image one line at a time by the discharge of pixels representing the background regions of the latent image.

4,595,260

LIQUID CRYSTAL PROJECTION DISPLAY WITH EVEN TEMPERATURE ELEVATION

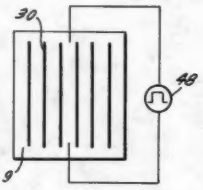
Keiichi Kubota, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 26, 1983, Ser. No. 498,258

Claims priority, application Japan, May 28, 1982, 57-90635; Aug. 11, 1982, 57-139365

Int. Cl.⁴ G02F *1/3*

U.S. Cl. 350—351 **4 Claims**



4. A thermally addressed liquid crystal light valve comprising, in the following order: a transparent substrate, a first transparent conductive layer, a light absorbing layer, a light reflecting layer, a first liquid crystal alignment layer, a liquid crystal material, a second liquid crystal alignment layer, a second tranparent conductive layer and a transparent substrate; at least one of the first and second transparent conductive layers being provided with a distributed resistance which causes heat due to the supply of a current to said conductive layer with thickness distribution which will cause the resistance distribution to stepwisely decrease from the center toward the periphery of said transparent conductive layers to evenly elevate the temperature of a whole area of said liquid.

4,595,261

PHASE RETARDATION ELEMENT AND PRISM FOR USE IN AN OPTICAL DATA STORAGE SYSTEM

Holger J. Baasch, Rochester, Minn.; Douglas S. Goodman, Yorktown Heights, N.Y.; Francis S. Luecke, Byron; Ronald L. Soderstrom, Rochester, both of Minn., and Eberhard A. Spiller, Mt. Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,604

Int. Cl.⁴ G02B *5/30, 1/08*

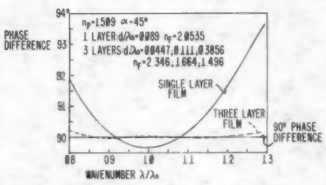
U.S. Cl. 350—394 **3 Claims**

1. An optical element for producing a phase difference of 90° between two perpendicular polarized components of a beam of radiation internally reflected in said element comprising:

an optical member formed of a material capable of supporting the propagation of a beam of radiation having a wavelength within a wavelength range extending from 0.74 μm to 0.98 μm;

a plane surface portion of said member;

a plurality of thin film coatings of dielectric materials layered on said plane surface portion;



said thin film coatings being of materials and thicknesses to produce throughout said wavelength range of substantially constant phase difference of 90° between two perpendicular polarized components of said beam of radiation when said beam is internally reflected at said plane surface portion.

4,595,262

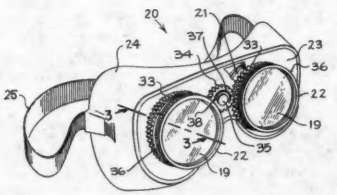
TUNABLE BIREFRINGENT SAFETY GOGGLES FOR LASER BEAMS

Norman E. Ogle, deceased, late of Palo Alto, Calif. by Barbara Ann Ogle, administratrix, assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Aug. 23, 1984, Ser. No. 643,535

Int. Cl.⁴ G02B *5/30;* G02C *7/12*

U.S. Cl. 350—404 **9 Claims**



1. Eye-protective goggles for attenuating optical radiation produced by a variable-wavelength radiation source, said goggles comprising a pair of oculars, each of said oculars including a birefringent filter that is tunable to a selected wavelength producible by said radiation source, both of said oculars being coupled so that the birefrigent filters in both of said oculars are simultaneously tunable to said selected wavelength.

4,595,263

PROJECTION LENS SYSTEM

John A. Clarke, Carshalton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1984, Ser. No. 628,375

Claims priority, application United Kingdom, Jul. 25, 1983, 8319940

Int. Cl.⁴ G02B *13/18*

U.S. Cl. 350—432 **6 Claims**

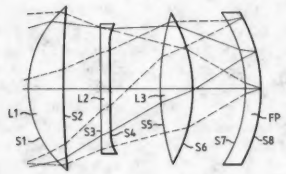
1. A lens system for projecting an image of a concave object surface onto a planar display screen, characterized in that the system lens, comprises first and third elements, each of positive power and each having one aspheric surface, and a second element between first and third elements, said second element having one aspheric surface, the powers of the elements being chosen so that

$0.50K < K_1 < 0.90K$

$-0.35K < K_2 < 0.20K,$

and

$0.70K < K_3 < 1.0K$



where K_1 is the power of the first element remote from the object surface, K_2 is the power of the second element, K_3 is the power of the third element adjacent to the object surface and K is the total power of the projection lens, each aspheric surface being defined by the following relationship:

$$Z = \frac{Cs^2}{1 + \sqrt{1 - \epsilon C^2 s^2}} + a_4 s^4 + a_6 s^6 + a_8 s^8 + a_{10} s^{10}$$

where Z is a deviation, in the axial direction, of the surface from a plane normal to the optical axis and tangent to the surface at its pole for a zone of the surface which is at a distance s from the axis, C is a curvature of the surface on the axis, ϵ is a conic constant, and a_4, a_6, a_8 and a_{10} are constants for the surface.

4,595,264

LENS SYSTEM FOR OPTICAL RECORDING TYPE DISKS

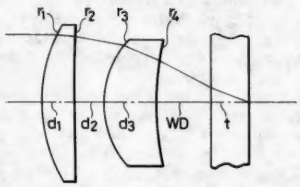
Toru Nakamura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 529,868

Claims priority, application Japan, Sep. 13, 1982, 57-158072; Sep. 14, 1982, 57-158949; Sep. 14, 1982, 57-158950

Int. Cl.[4] G02B 9/06

U.S. Cl. 350—480 **24 Claims**



1. A lens system for optical recording type disks comprising first and second lenses wherein said first lens is a positive lens and said second lens is a positive lens, said lens system being arranged such that at least one of the surfaces, including the surface on the exit side of said first lens, the surface on the entrance side of said second lens, and the surface on the exit side of said second lens is formed as an aspherical surface arranged such that the vertex portion thereof is approximated by a spherical surface, said lens system being arranged to fulfill the condition (1) shown below:

$$0.4 < \Sigma d/f < 0.9 \quad (1)$$

where reference symbol f represents the focal length of the lens system as a whole and reference symbol Σd represents the overall length of the lens system, and in which the surface on the exit side of said first lens is formed as an aspherical surface expressed by the formula of aspherical surface shown below wherein reference symbol r represents the radius of curvature of said vertex portion of said aspherical surface, reference symbol x represents the distance from an arbitrary point on said aspherical surface to the tangential plane which is tangential to said surface at the vertex thereof, and reference symbol y represents the distance from said arbitrary point to the optical axis, said lens system being arranged to further fulfill the conditions (2) and (3) shown below:

$$x = \frac{\frac{y^2}{r}}{1 + \sqrt{1 - \left(\frac{y}{r}\right)^2}} + E_2 y^4 + F_2 y^6 + G_2 y^8 + \ldots$$

$$0.05 < E_2 f^3 < 0.25 \quad (2)$$

$$-0.05 < F_2 f^5 < 0.1 \quad (3)$$

where, reference symbols E_2, F_2, G_2, . . . respectively represent coefficients of aspherical surface.

4,595,265

PORTABLE FIELD INSPECTION MICROSCOPE FOR INSPECTING A BUTT END OF A CYLINDRICAL OBJECT, SUCH AS A FIBER OPTICS CABLE

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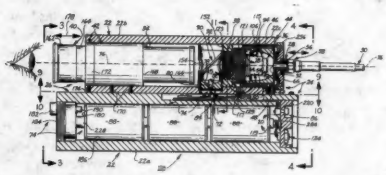
Filed Apr. 4, 1983, Ser. No. 481,854

Int. Cl.[4] G02B 21/06, 21/10, 21/14

U.S. Cl. 350—523 **4 Claims**



1. A portable field inspection microscope for inspecting a butt end surface of a cylindrical object, such as a fiber optics cable, having both a butt end and a butt-end-surface, which is to be inspected, comprising: a housing means provided with a butt-end-receiver, holder and positioner for receiving and holding and positioning a butt end, and a butt-end-surface of a cylindrical object, such as a fiber optics cable, in a location and position such as to cause the butt-end-surface to be coincident with a selected butt-end-surface viewing-focusing plane, said housing means being provided with an optical-path defining a longitudinal inner chamber means having a corresponding longitudinal optical axis centered along the length of said chamber and optically communicating at one front end with said butt-end receiver, holder and positioner, and being intermediately provided with objective lens mounting means and microscope objective lens means optically aligned with said receiver, holder and positioner focusable on the focusing plane and any cylindrical object's butt-end-surface coincident with the focusing plane; said optical-path-defining chamber means being provided adjacent to an opposite rear end of said chamber means with eyepiece lens mounting means and eyepiece lens means longitudinally adjustably carried by said eyepiece

lens mounting means for focusing and providing a desired degree of apparent visual image magnification of a butt end surface of a cylindrical object being viewed and inspected while received, held and positioned in the focusing plane; said objective lens means, said objective lens mounting means, said eyepiece lens means, said eyepiece lens mounting means, and said optical-path-defining chamber means, together, effectively defining an inspection microscope effectively provided with focusing means comprising means for manually adjusting the relative longitudinal spacings between various of said lens means relative to each other and relative to the focusing plane and said butt-end-surface of said butt end of said cylindrical object, such as said butt-end-surface of said butt end of said fiber optics cable, co-planar with the focusing plane; said optical-path-defining longitudinal inner chamber means of said housing means being provided with and carrying illuminator means within said chamber means for providing, in a symmetrically positioned manner, within the optical-path-defining chamber means, illuminating light directed forwardly, said illuminator means being carried centrally by and in said optical-path-defining chamber means and being provided with separate, transversely connectable, controllably operable, electrical energizer means for controllably energizing and deenergizing said illuminator means; said illuminator means carried within said optical-path-defining longitudinal inner chamber means of said housing means comprising a bright field illuminator means substantially centrally positioned within said optical-path-defining chamber means, being located and directed for injecting illuminating light into the optical path along an optical axis of said optical-path-defining chamber means in a manner such as to redirect same forwardly and longitudinally along said optical path through said objective lens means toward said focusing plane in a direction substantially normal to said focusing plane for causing substantially directly reversed rearward reflection of light from a butt-end-surface being viewed and inspected in what is termed a bright field illuminated manner; said illuminator means carried within said optical-path-defining longitudinal inner chamber means of said housing further comprising a dark field illuminator means substantially concentrically positioned within said optical-path-defining chamber means and concentrically positioned around a central optical axis extending the length of said optical-path-defining chamber means and being located and directed for injecting obliquely directed substantially annularly arranged and concentrically positioned dark field illuminating light forwardly convergingly along said optical-path-defining chamber means just rearwardly of said focusing plane and directed sharply transversely convergingly centrally and forwardly angularly onto the focusing plane, and onto any cylindrical object's butt-end-surface co-planar with the focusing plane, for providing maximum oblique transversely-directed dark field illumination of the butt-end-surface being viewed and inspected in the focusing plane for causing rearward light reflection to occur only from surface irregularities and discontinuities on such a butt-end-surface being viewed and inspected while reflecting all other angularly incident light angularly impinging upon such a butt-end-surface in an angular reflected direction such as to be incapable of being returned to the eyepiece lens means and thus providing what is herein termed dark field illumination of such a butt-end-surface being inspected and viewed in the focusing plane, said angularly incident dark-field-illuminating light, and the means producing and angularly directing the angularly incident dark-field-illuminating light being so arranged, directed, and located relative to the focusing plane and relative to a front end of the centrally positioned objective lens means, as to cause rearwardly angularly directed dark field light reflections reflected from a butt-end-surface portion normal to the longitudinal optical axis to rearwardly and outwardly angularly diverge from the central longitudinal optical axis to an extent such as to be laterally displaced sufficiently to entirely miss, and to entirely laterally by-pass, the centrally symmetrically positioned objective lens means which optically encompasses a narrow central area of the chamber means immediately around the longitudinal optical axis only; said focusing means comprising a focusing assembly taking the form of an outer spirally grooved sleeve, provided with and defining an outer spiral groove, an inner longitudinally grooved sleeve, provided with and defining an inner longitudinal groove, and a short transverse fixed pin carried by said housing means and having a fixed end projecting into said grooves in both of said sleeves whereby relative rotation of said outer spirally grooved sleeve with respect to said fixed pin end will effectively produce longitudinal focusing movement of the pair of said sleeves and said butt end, and said corresponding butt-end-surface, of said cylindrical object, such as said butt-end-surface of said fiber optics cable, otherwise fixedly carried by said focusing assembly at a forward center portion of said focusing assembly concentric with the longitudinal optical axis of said chamber means, said focusing assembly being substantially centrally provided with controllably operable cable-holding means for receiving and being manually controllably firmly fastened around an outer cylindrical surface adjacent to a butt end of a cylindrical object, such as fiber optics cable.

4,595,266

MULTIPLE PROJECTION OPTICS SLIDE PROJECTION APPARATUS USING A CIRCULAR SLIDE TRAY, HAVING FIXED-POSITION SLIDE GATES

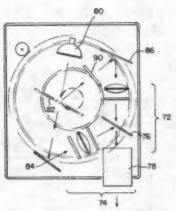
Gideon A. Kramer, Seattle, Wash., assignor to Source Kramer Corporation, Mukilteo, Wash.

PCT No. PCT/US84/00429, § 371 Date Mar. 16, 1984, § 102(e) Date Mar. 16, 1984, PCT Pub. No. WO85/04265, PCT Pub. Date Sep. 26, 1985

PCT Filed Mar. 16, 1984, Ser. No. 609,542

Int. Cl.[4] G03B *23/16*

U.S. Cl. 353—94 **10 Claims**



1. A slide projection apparatus which is adapted for operation with a circular slide tray which rotates about a central vertical axis and which has a lower pan portion with only one slot therein through which slides can move and an upper receptacle portion comprising a series of compartments in which slides are arranged in a predetermined sequence, the apparatus comprising:

first and second projection optics systems defining first and second image projection paths, each projection optics system including a fixed position slide gate located beneath the slide tray, wherein slides move into and from said slide gates relative to the circular slide tray;

means for rotating the lower pan portion circular slide tray and the upper receptacle portion and for rotating one portion independently of the other portion, so that the one slot in the lower pan portion and the compartments in the upper receptacle portion can be brought into alignment with the slide gates; and,

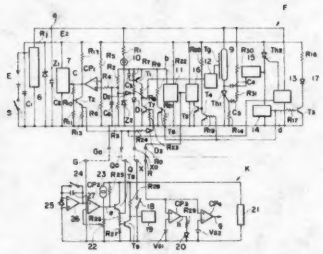
means for controlling the rotation of the slide tray and for controlling the movement of the slides into and from the compartments of the slide tray in such a manner that the compartments of the slide tray can be accessed with respect to either slide gate, so that a sequence of slides present in consecutive compartments of the slide tray may be displayed in said sequence using the first and second projection optics systems in any sequence.

4,595,267

METHOD OF SENDING AND RECEIVING SIGNALS IN PHOTOGRAPHY WITH CAMERA AND CAMERA FLASH DEVICE FOR THAT METHOD

Yoshifumi Kuroki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,514
Claims priority, application Japan, Jun. 9, 1981, 56-88532
Int. Cl.[4] G03B *7/00, 15/05*
U.S. Cl. 354—413 **4 Claims**



1. A method for transmitting signals between a photographic camera and a flash device for making flashlight photography, the camera and the flash device, respectively, having a plurality of electrical terminals through which signals are transmitted between the camera and the flash device, said method comprising the steps of:

transmitting an iris information signal, which signal is produced in said flash device and is composed of a periodic pulse train, to said camera through one of said electrical terminals of the flash device and through a corresponding one of said electrical terminals of the camera, for the purpose of setting an exposure level before photographing;

terminating said iris information signal upon closure of a contact of said camera;

generating in said camera a light adjustment signal upon detection of an appropriate level by a photometric circuit so as to stop the light emission from a discharge tube of said flash device; and

supplying the light adjustment signal to the flash device through said corresponding one of said electrical terminals of the camera and through one of said electrical terminals of the flash device.

4,595,268

CAMERA HAVING LENS PROTECTION COVER

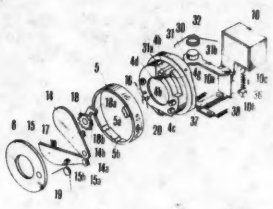
Takayuki Tsuboi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 596,542, Apr. 4, 1984, which is a continuation of Ser. No. 351,606, Feb. 23, 1982, Pat. No. 4,457,604. This application Sep. 17, 1985, Ser. No. 777,007
Claims priority, application Japan, Feb. 27, 1981, 56-27320; Feb. 27, 1981, 56-27321; Feb. 27, 1981, 56-27322; Feb. 27, 1981, 56-27323
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—149.11 **2 Claims**

1. A camera comprising:

(a) an optical system protection means for closing and opening the front side of an optical system; and

(b) an operation member changeable between a first state and a second state for opening and closing the protection means, said operation member effecting change of the



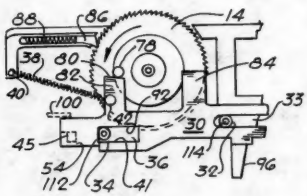
photographic mode of the camera when changed to a third state.

4,595,269

CAMERA DOUBLE EXPOSURE PREVENTION SYSTEM

Wai C. Wong, Hong Kong, Hong Kong, assignor to W. Haking Enterprises Limited, Hong Kong

Filed Oct. 9, 1984, Ser. No. 659,233
Int. Cl.[4] G03B *17/42*
U.S. Cl. 354—204 **11 Claims**



1. In a still camera having a shutter actuating means and film advancing means for advancing a filmstrip, said shutter actuating means including a slider member movable bodily in two opposite linear directions aligned along a given axis between a first or released and a fully cocked position, resilient biasing means for urging said slider member to said released position to operate the camera shutter, latching means responsive to movement of said slider member to a fully cocked position for captively retaining said slider member in such position against the return force of said biasing means, latch release means coupled to said latching means and responsive to an applied pressure for releasingly disengaging said latching means from said slider member to allow movement thereof to said released position, said film advancing means being coupled to said slider member to move said slider member from said released to said fully cocked position to be captured by said latching means before the next film frame has been fully advanced, the film advancing means then reaching the final position where film advancement is complete, the improvement comprising:

pivot-forming means for supporting said slider member for movement between a first latch release blocking and a second non-blocking orientation thereof where said latch release means is respectively inoperative and operative to release said latching means, said blocking orientation being maintained at least from the time the slider member is in said fully cocked position and until the preceding film frame has been fully advanced, said latching means retaining said slider member in a cocked position when said slide member has both of said orientations, and means responsive to the movement of said film advancing means into said final position to pivot said slide member from said blocking to said non-blocking orientation.

4,595,270

FINDER SYSTEM

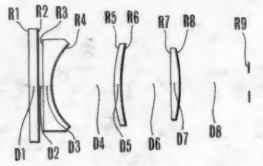
Yasuyuki Yamada, Tokyo; Kazuo Fujibayashi, Kanagawa; Yasuhisa Sato, Kanagawa, and Hideo Yokota, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 603,197

Claims priority, application Japan, Apr. 27, 1983, 58-63681[U]

Int. Cl.[4] G03B *13/10*

U.S. Cl. 354—222 5 Claims



1. A finder system comprising:

(a) an eyepiece having a positive refractive power and defining an optical axis;

(b) a first objective lens having a negative refractive power and arranged on the object side of said eyepiece with an optical axis in coincidence with the optical axis of said eyepiece;

(c) a viewfinder frame representing a viewfield;

(d) an optical member having a reflection surface for providing a reflected image of said viewfinder frame to said eyepiece and positioned in a space between said first objective lens and said eyepiece; and

(e) a second objective lens interchangeable with said first objective lens, having a refractive power different from that of said first objective lens, and including a positive lens and a negative lens.

4,595,271

IN-FOCUS STATE DETECTION DEVICE

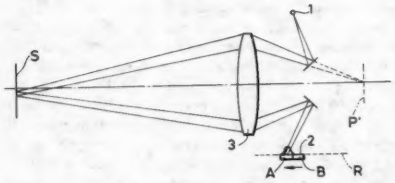
Shigeyuki Suda, Tokyo; Yukichi Niwa, Narashino; Yasuo Ogino, and Mitsutoshi Ohwada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 665,982

Claims priority, application Japan, Nov. 5, 1983, 58-207978

Int. Cl.[4] G03B *3/00*; G01J *1/20*

U.S. Cl. 354—403 18 Claims



1. An in-focus state detection device for detecting an in-focus state of an object lens, comprising:

light generating means for generating a detection light;

projection means for projecting said detection light on said object through a first aperture of said objective lens;

sensing means having a first and a second area for producing a signal concerning the light intensity balance between said two areas, said signal indicating a focusing state of said objective lens;

guiding means for guiding the detection light reflected from said object into said sensing means through second aperture of said objective lens different from said first aperture; and

correction means for moving the boundary between said first and second areas in a direction perpendicular to an optical axis of said objective lens in accordance with a chromatic aberration information of said objective lens to correct the detection error.

4,595,272

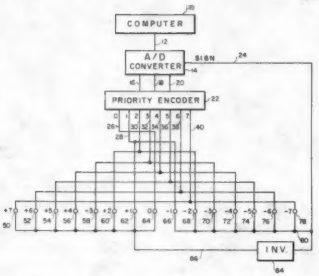
CAMERA FOCUS INDICATOR

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 25, 1981, Ser. No. 277,563

Int. Cl.[4] G03B *7/08*

U.S. Cl. 354—409 2 Claims



1. A photographic indicator for use with a camera autofocus system which produces an output signal of magnitude indicative of the amount the camera lens should be moved to each a proper focus position, and of a first or second characteristic indicative of the direction the camera lens should be moved, to reach the proper focus position comprising:

a plurality of signal reponsive devices, a first group of which comprises devices each of which is responsive to an output signal of a different magnitude but only when the output signal is of the first characteristic and a second group of which comprises devices each of which is responsive to an output signal of a different magnitude, but only when the output signal is of the second characteristic, so that the response of the individual device is indicative of the amount and direction that the camera lens should be moved to reach a proper focus position,

means connected to receive the output signal and operable to provide a resultant signal on one of a plurality of output terminals depending on the magnitude, and to provide a characteristic signal on a further terminal, and

means connecting one device from each group to a different one of the output terminals, while connecting all of the devices from each group to the further terminal.

4,595,273

COPYING APPARATUS AND METHOD AUTOMATICALLY SEQUENTIALLY COPYING TWO DIFFERENT PAGES OF A DOCUMENT

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Filed Mar. 30, 1984, Ser. No. 595,359

Claims priority, application Japan, Mar. 30, 1983, 58-54305

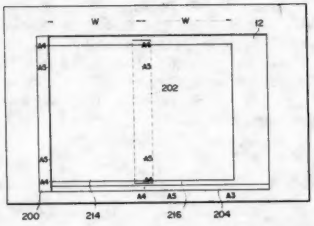
Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R 21 Claims

19. A method of photocopying adjacent pages comprising the steps of:

(1) placing first and second rectangular pages each of a predetermined width and height onto a document table;

(2) placing a first edge of said first page in contact with a second edge of said second page;
(3) directing light toward said first page;
(4) forming a latent image enlarged by a first predetermined factor on a rotating photosensitive drum, said image corresponding to the portion of the light directed by said directing step (3) and reflected by said first page, said image being enlarged only in the dimension corresponding to the dimension between a second edge of said first page parallel to said first edge and the first edge of said first page;
(5) conveying a first medium having dimensions equal to the dimensions of the first page along a conveyance path in contact with said rotating drum, including the step of aligning an edge of the latent image formed by said forming step (4) corresponding to the second edge of said first page with an edge of said first medium;
(6) transferring the entire latent image formed by said forming step (4) from said drum to said first medium except for the portion of said image corresponding to said first edge of said first page;



(7) subsequent to said transferring step (6), directing light towards said second page;
(8) forming an image enlarged by another predetermined factor on the rotating photosensitive drum, said image corresponding to the portion of the light directed by said directing step (7) and reflected by said second page, said image being enlarged only in the dimension corresponding to the dimension between said second page second edge and a first edge of said second page parallel to said second edge thereof;
(9) conveying a second medium having dimensions equal to the dimensions of said second page along said conveyance path in contact with said rotating drum, including the step of aligning the edge of said image corresponding to said first edge of said second page with an edge of said second medium; and
(10) transferring the entire latent image formed by said forming step (8) from said drum to said second medium except for the portion of said image corresponding to the second edge of said second page.

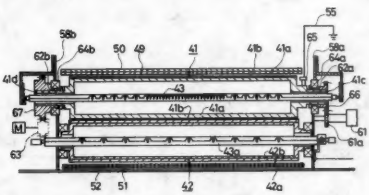
4,595,274

FIXING APPARATUS

Masaaki Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,327
Claims priority, application Japan, Oct. 14, 1983, 58-190930
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—3 FU **21 Claims**

1. A fixing apparatus for fixing an unfixed material on a recording medium, comprising:
first and second rotating members for pressing and conveying the recording medium and fixing the unfixed material on the recording medium, said first rotating member having a thermally conductive base and a heat-resistant, electrically and thermally insulating surface layer formed on an outer surface of said thermally conductive base, said second rotating member having a heat-resistant insulating surface layer, said first rotating member being brought into contact with said second rotating member with said surface layers thereof facing each other;
heating means for heating said first rotating member;
means for bringing said first rotating member into pressure contact with said second rotating member;
means for transmitting a driving force for rotating said first rotating member;



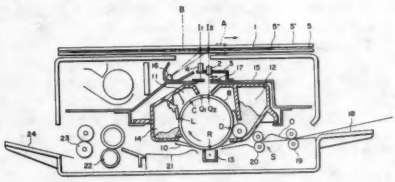
a frame member for rotatably supporting said first rotating member;
heat insulating means provided between the thermally conductive base of said first rotating member and said frame member and between the thermally conductive base of said first rotating member and said transmitting means; and
means for electrically grounding said thermally conductive base of said first rotating member.

4,595,275

VARIABLE MAGNIFICATION COPYING APPARATUS

Hiraku Sonobe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,067
Claims priority, application Japan, Mar. 8, 1983, 58-36577
Int. Cl.[4] G03G *15/30, 15/00*
U.S. Cl. 355—8 **6 Claims**



1. A variable magnification copying apparatus comprising:
an electrophotographic type photosensitive member movable by a first exposure station, a second exposure station and a transfer station in sequence;
means for moving an original to be copied through a first illumination position and a second illumination position in the order named;
a first imaging element array for forming a light image of the original moving through said first illumination position on said photosensitive member at m_1 magnification at said first exposure station in m_1 magnification copy mode;
a second imaging element array for forming a light image of the original moving through said second illumination position on said photosensitive member at m_2 magnification at said second exposure station in m_2 magnification copy mode;
registration means for holding a transfer material at a stand-by position when it is not actuated and for moving the transfer material out of the stand-by position toward said transfer station when it is actuated; and
control means for actuating said registration means, said

control means actuating said registration means a first predetermined time after said photosensitive member begins to be exposed to the light image of the original at said first exposure station in the m_1 magnification copy mode, and actuating said registration means, a second predetermined time after said photosensitive member begins to be exposed to the light image of the original at said second exposure station in the m_2 magnification copy mode, said second predetermined time being different from said first predetermined time by a period corresponding to the distance between said first and second exposure stations.

4,595,276

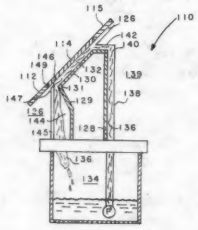
INCLINED TONER FLOW CONTROL SYSTEM FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE UPON A ROLL CASSETTE, APERTURE CARD, OR MICROFICHE TYPE ELECTROPHOTOGRAPHIC FILM ELEMENT

John D. Plumadore, Westfield, Mass., assignor to Photon Chroma, Inc., Westfield, Mass.

Continuation-in-part of Ser. No. 403,806, Jul. 30, 1982, Pat. No. 4,515,463. This application May 6, 1985, Ser. No. 730,996

Int. Cl.[4] G03G *15/10*

U.S. Cl. 355—10 **20 Claims**



1. A toner flow control system for developing an electrostatic latent image upon a predetermined partial portion of an electrophotographic film element, comprising:

a developing electrode;

an electrophotographic film element disposed parallel to, yet spaced from, said development electrode so as to define therewith a channel therebetween;

means defining an electrostatic latent image frame upon said predetermined partial portion of said electrophotographic film element, including upper, lower, and side edge image frame portions, such that said electrostatic latent image faces said development electrode;

means for introducing toner into said channel such that said toner flows across said electrostatic latent image frame from within the vicinity of said upper edge portion of said image frame to within the vicinity of said lower edge portion of said image frame for development of said electrostatic latent image upon said predetermined partial portion of said electrophotographic film element;

said development electrode, said electrophotographic film element, and said toner channel being disposed within planes inclined with respect to a horizontal plane such that said toner may flow through said channel, and over the facing surfaces of said predetermined partial portion of said film element and said development electrode, in a controlled manner under the influence of gravitational forces; and

passive means disposed in a non-contact mode within the vicinity of said lower edge portion of said image frame for cooperating with said toner, flowing over said facing surface of said predetermined partial portion of said film element and within said vicinity of said lower edge portion of said image frame, in the establishment of attractive forces defined between said passive means and said toner so as to facilitate the discharge of said toner from said electrophotographic film element within a substantially vertical plane under the influence of said gravitational forces such that said toner does not deleteriously affect the remaining portion of said electrophotographic film element outside of said predetermined partial portion of said electrophotographic film element upon which said image frame is defined.

4,595,277

TONER SUPPLY CONTROL SYSTEM

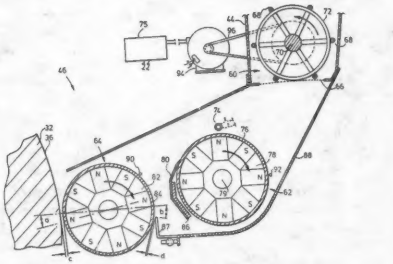
Andrzej Maczuszenko, 92 Pennyhill Drive, Scarborough, Ontario M1B 3J9; Sotos M. Theodoulou, 23 Greenmount Road, Bramalea, Ontario L6S 1C3; Kenneth L. Hurley, 38 Buchanan Drive, Unionville, Ontario L3R 4C7, and Dolf Landheer, 26 Euclid Avenue, Ottawa, Ontario K1S 2W3, all of Canada

Filed Jan. 30, 1984, Ser. No. 574,820

Claims priority, application Canada, Feb. 1, 1983, 420680

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—14 D **6 Claims**



1. A toner system for feeding powder toner to a dielectric surface carrying an electrostatic image to be toned, the system comprising:

a hopper having a bottom opening;

an agitator including a screen having a top surface and a bottom surface with a plurality of wall means, each wall means defining a screen opening between the top surface and the bottom surface, the screen being placed across a hopper adjacent the bottom opening to support toner in the hopper, the toner bridging the screen openings and the screen being above a substantially toner free space;

an agitator element in contact with the top surface of the screen; and

drive means operable to move the agitator element across the top surface of the screen to disrupt said toner bridging the screen openings and permit toner to fall through the screen openings into the toner free space until a predetermined amount of the toner collects in this space;

a cylindrical applicator positioned adjacent the dielectric surface for receiving toner from the agitator;

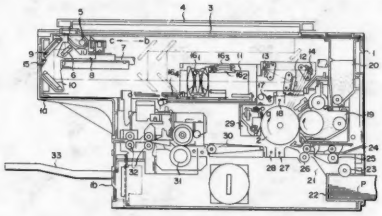
sensor means positioned to sense shortage of toner in said space and to provide a signal indicating such shortage; and

means responsive to said signal and coupled to the agitator to drive the agitator to release more toner into said space for use on the applicator.

4,595,278
IMAGE FORMING APPARATUS

Naohiko Matsuo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 21, 1984, Ser. No. 684,721
Claims priority, application Japan, Dec. 26, 1983, 58-246132
Int. Cl.[4] G03G *15/00, 15/28;* G03B *27/54*
U.S. Cl. 355—14 R **6 Claims**



1. An image forming apparatus comprising:

document table exposure means for receiving a document thereupon;

illumination exposure means for illuminating a document placed on said document table exposure means;

scanning means for reciprocating one of said exposure means relative to the other of said exposure means to optically scan a document on said document table exposure means; and

image forming means for forming an image of the document in response to light reflected by the document, which further comprises:

(a) means for detecting that said one of said exposure means that reciprocates is located at a scanning start position, a scanning end position, and a third position removed by a predetermined distance from the scanning start position and producing an output indicative of the scanning start position, the scanning end position, or the third position; and

(b) exposure controlling means for, in a continuous copying mode: (i) turning on said illumination exposure means when said one of said exposure means that reciprocates is located at said third position, and (ii) turning off said illumination exposure means when said one of said exposure means that reciprocates is located at the scanning end position, in response to said indicative output from said detecting means.

4,595,279
RECORDING APPARATUS WITH SPEED CONTROL

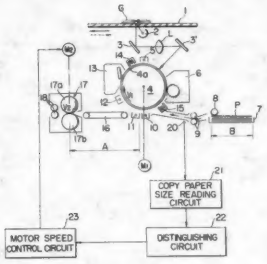
Hiroshi Kuru, Hachioji; Hirofumi Sakaguchi, and Takao Shiozawa, both of Akigawa, all of Japan, assignors to Konishiroku Photo Ind. Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,394
Claims priority, application Japan, Oct. 6, 1983, 58-185976
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **16 Claims**

1. In a recording apparatus having an electrostatic image support means and a fixing device, wherein the toner image formed on said electrostatic image support means is transferred onto a copy paper, and said copy paper is separated from the surface of said electrostatic image support means and then led to said fixing device to thereby fuse by heat said toner image to said copy paper,

said recording apparatus comprising;

a distinguishing means for determining the relation in the length between the distance (A) from the separating position at which said copy paper is separated from said electrostatic image support means to the fixing position of said fixing device and the length (B) in the transport direction of said copy paper, distance (A) being shorter than the length (B) of the largest size of copy paper to be used, and a control means for controlling the relative circumferential

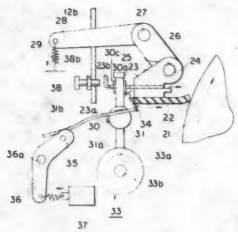


speeds of said electrostatic image support means and said copy paper transport means provided inside said fixing device according to the output of said distinguishing means.

4,595,280
BLADE CLEANING DEVICE

Misao Tanzawa; Kinzi Saito, both of Kawasaki, and Ichiro Fukushima, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,298
Claims priority, application Japan, Dec. 2, 1982, 57-210579; Dec. 17, 1982, 57-220338
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 **16 Claims**



1. A cleaning device for cleaning a surface comprising:

first supporting means pivotally supported by a frame of said device, said first supporting means including a shaft rotatably supported by the frame of said device, a first supporting member fixedly mounted on said shaft and a pressure lever mounted on said shaft integrally with said first supporting member;

second supporting means pivotally supported by said first supporting means;

a cleaning blade fixedly attached to said second supporting means;

first biasing means interposed between said first and second supporting means, said first biasing means biasing said first and second supporting means to move said blade closer to said surface;

second biasing means extended between said pressure lever of said first supporting means and the frame of said device, said second biasing means biasing said first supporting means to move said blade closer to said surface; and

means for limiting the pivotal motion of said first supporting means over a predetermined angle, said means for limiting including a hole of predetermined size formed in the frame of said devide and a connection pin extended between said

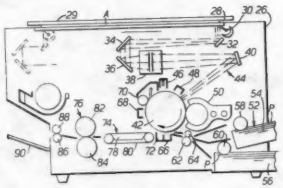
first supporting member and said pressure lever as passed through said hole.

4,595,281

ORIGINAL DOCUMENT SCANNING DEVICE

Hideshi Oushiden, Kawasaki, and Akihiro Nishijima, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 3, 1985, Ser. No. 688,637
Claims priority, application Japan, Jan. 9, 1984, 59-1651
Int. Cl.[4] G03B 27/48, 27/50
U.S. Cl. 355—51 3 Claims



1. An original document scanning device comprising:

scanning means for exposing an original document and directing light reflected from the original,

driving means for moving said scanning means along said original document of a preselected speed,

memory means for storing data relative to an acceleration to bring said scanning means to a maximum scanning speed, and

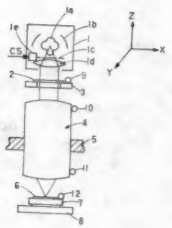
control means for reading data, required to bring said scanning means to a preselected speed, from among the data stored in said memory means and for controlling said driving means according to the read data.

4,595,282

RECORDING APPARATUS

Kazuo Takahashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,348
Claims priority, application Japan, Aug. 2, 1983, 58-140567
Int. Cl.[4] G03B 27/42
U.S. Cl. 355—53 13 Claims



1. An apparatus for use with a radiation-sensitive member, comprising:

means for holding the radiation-sensitive member;

image forming means for applying radiation energy having a distribution pattern to the radiation-sensitive member to form an image thereon;

vibration detecting means for detecting relative vibratory movement between the radiation-sensitive member and the distribution pattern of the radiation energy to be applied to the radiation-sensitive member, said detecting means producing a detection signal; and

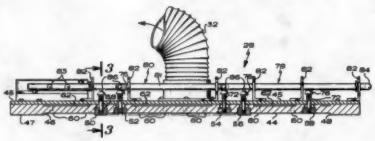
means for discriminating, on the basis of the detection signal supplied from said detecting means, whether said image forming means is to be actuated.

4,595,283

APPARATUS AND METHOD FOR ADVANCING PHOTOGRAPHIC PRINT PAPER

Stephen A. Bartz, Jordan, and Wayne D. Gunderson, Brooklyn Park, both of Minn., assignors to Lucht Engineering, Inc., Minneapolis, Minn.

Filed Apr. 3, 1984, Ser. No. 596,284
Int. Cl.[4] G03B 27/60
U.S. Cl. 355—73 16 Claims



1. An improvement in a paper advance apparatus for use with a photographic printer for advancing photographic paper in said printer, the apparatus including a paper supply, pinch roller means for moving the paper along a paper path including an exposure station and reference means for referencing a leading edge of the photographic print paper, the improvement wherein said pinch roller means are positioned between the paper supply and exposure station and further comprising:

vacuum source means for supplying a vacuum force that does not significantly increase regardless of the amount of vacuum being obstructed; and

a stationary vacuum platen positioned after the pinch roller means having a pair of spaced-apart guides defining a paper path along a print paper-engaging surface on a bottom side of the platen along the paper path, and having a plurality of vacuum ports located on the print paper-engaging surface in communication with the vacuum source means and disposed to support the print paper against the paper-engaging surface in a manner such that the leading edge of the print paper is held against the paper-engaging surface during advancement of the print paper without any other support.

4,595,284

METHOD AND APPARATUS FOR MEASURING DISTRIBUTION OF ELONGATION IN AN OPTICAL CABLE

Koichi Tatekura, Hiratsuka; Kiyofumi Mochizuki, Hachioji, and Yoshihiro Ejiri, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Japan

Filed Dec. 22, 1983, Ser. No. 564,534
Claims priority, application Japan, Jan. 7, 1983, 58-514
Int. Cl.[4] G01N 21/84
U.S. Cl. 356—73.1 4 Claims

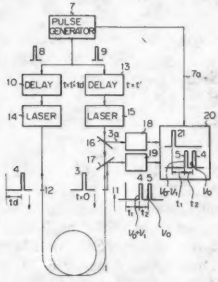
1. A method for measuring distribution of elongation in an optical fiber cable, comprising the steps of:

applying optical pulses to both ends of an optical fiber cable to be tested so that said applied optical pulses meet at a desired location along the cable,

measuring a time period t_1 and a time period t_2, where t_1 is the arrival time of the faster pulse of a Stokes pulse which is generated in said cable according to the stimulated Raman effect and a pumping pulse which is applied to said cable and propagates therealong, and t_1+t_2 is the arrival time of the other pulse,

determining distribution of elongation ($d\Delta z/dz$) using the

equations $z=k_1t_1-k_2t_2$, and $\Delta z=k_3t_2-k_4t_1$, where k_1, k_2, k_3 and k_4 are constants, z is the length of said cable between an end thereof and a location to be tested, and z is the elongation of a small length at location z.



4,595,285

TRANSLUCENT DOCUMENT COVER FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

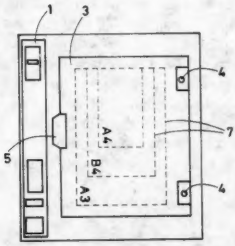
Yoshihisa Miwa, and Haruyoshi Migita, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1984, Ser. No. 673,735

Claims priority, application Japan, Nov. 24, 1983, 58-222389; Nov. 24, 1983, 58-222392

Int. Cl.[4] G03B *27/62, 27/52*

U.S. Cl. 355—75 **6 Claims**



1. An electrophotographic copying machine comprising:

table means on which a copy document is to be placed for copying; and

translucent cover means for covering and pressing the copy document onto said table means, said cover means having a opacity of from about 80–85%.

4,595,286

SPREAD DOCUMENT COPYING METHOD WITH VARIABLE MAGNIFICATION CAPABILITY

Shuichi Yamazaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,105

Claims priority, application Japan, Mar. 1, 1984, 59-37251

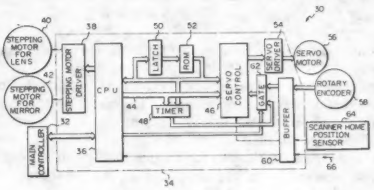
Int. Cl.[4] G03B *27/32*

U.S. Cl. 355—77 **5 Claims**

1. A method of copying a spread document onto copy sheets of a predetermined size to a predetermined magnification by scanning the document, comprising the steps of:

(a) dividing the spread document to be scanned into two faces; and

(b) commencing the scanning of the two faces at predetermined positions which positions are different from each other so as to image the two faces, which comprises commencing said scanning at a predetermined home position when the first of the two faces is to be reproduced, and commencing the scanning at a position whose displacement from the home position is determined by dividing the size of the copy sheet by the magnification when the second of the two faces is to be imaged.



4,595,287

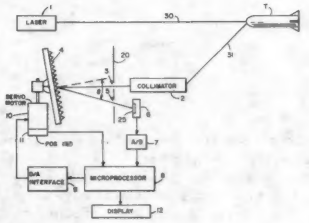
DOPPLER EFFECT LASER VELOCITY MEASURING SYSTEM

George R. Edlin, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 18, 1984, Ser. No. 571,766

Int. Cl.[4] G01P *3/36;* **G01B** *11/26, 11/00*

U.S. Cl. 356—28.5 **5 Claims**



1. A measuring system comprising a laser generating means for directing first electromagnetic energy at a first frequency towards a moving target in space; said target moving relative to the measuring system; reflected second electromagnetic energy from said target; an optical grating; a first device for collecting said second reflected electromagnetic energy and directing it towards said optical grating; an electromagnetic detector located spatially from said grating so as to receive electromagnetic energy refracted from said grating; positioning means attached to said grating so as to move said grating to an angle such that maximum electromagnetic energy is directed to said detector; and indicator means connected to said positioning means for measuring the position of said grating; and measurement means responsive to the position of said grating for producing an output proportional to the change in frequency of the reflected energy caused by doppler shift from said target.

4,595,288

METHOD AND APPARATUS FOR MEASURING DEEP MIRRORS

Werner Rambauske, Carlisle, Mass., assignor to Varo, Inc., Garland, Tex.

Filed Sep. 26, 1983, Ser. No. 535,839

Int. Cl.[4] G01B *9/00, 11/24*

U.S. Cl. 356—124 **41 Claims**

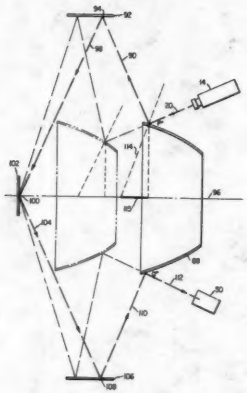
1. An apparatus for measuring the quality of the optical surfaces of a mirror having a symmetrical axis, comprising:

means for generating a light ray;

first stationary directing means for directing the light ray to impinge upon a first point on the optical surface of the mirror, the reflected light ray therefrom directed to intersect the symmetrical axis at a predetermined intersection point;

a stationary axial reflecting surface disposed at said predetermined intersection point and perpendicular to the symmetrical axis for reflecting the light ray incident thereon;

second stationary directing means for directing the light ray reflected from said axial reflecting surface to impinge a second point on the optical surface of the mirror and symmetrical with respect to the first point and the the symmetrical axis, the reflected light ray therefrom directed to an external point;



detecting means for detecting positional deviations in the light ray at the external point;

means for moving the mirror longitudinally along and rotationally about its symmetrical axis relative to said first and second directing means, said axial reflecting surface, said generating means and said detecting means; and

said first and second directing means and said axial reflecting surface maintaining the position of the ight ray at said external point constant as the position of the mirror is varied longitudinally along and rotationally about the symmetrical axis thereof, positional deviations at said detecting means indicating imperfections in the optical surface of the mirror.

4,595,289

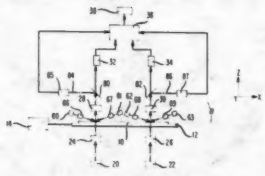
INSPECTION SYSTEM UTILIZING DARK-FIELD ILLUMINATION

Martin Feldman, and Lynn O. Wilson, both of New Providence, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 25, 1984, Ser. No. 573,816

Int. Cl.[4] G01B *11/00, 11/24*

U.S. Cl. 356—237 **28 Claims**



1. Apparatus for inspecting corresponding portions of patterns that comprise features defined on a substrate and for providing an indication of defects in said portions, said apparatus comprising

means for illuminating said corresponding portions in a dark-field mode to scatter light from illuminated feature or defect edges,

and means responsive only to light scattered from edges in said corresponding portions for generating difference signals representative of defects in said illuminated portions.

4,595,290

DEVICE FOR MEASURING LIGHT INCIDENT ON AN OPTICAL SYSTEM

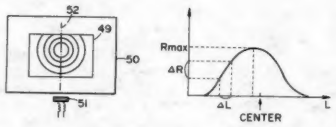
Noriyuki Nose, and Kiyonobu Endo, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1981, Ser. No. 283,233

Claims priority, application Japan, Jul. 24, 1980, 55-101506; Jul. 24, 1980, 55-101507; Jul. 24, 1980, 55-101509; Jul. 24, 1980, 55-101514

Int. Cl.[4] G01J *1/42*

U.S. Cl. 356—225 **9 Claims**



1. A device for mesuring light incident on an optical system, comprising:

an optical system for defining an optical path;

a beam splitter having a relief type diffraction lattice including a plurality of semi-reflecting oblique surfaces periodically arranged on a tranparent body, said diffraction lattice being disposed along the optical path to diffract a portion of the incident light and transmit another portion of the incident light, wherein the ratio of light diffraction to light transmission has a predetermined non-uniform distribution and changes continuously over the lattice area; and

photo detector means for detecting the light diffracted from said diffraction lattice.

4,595,291

PARTICLE DIAMETER MEASURING DEVICE

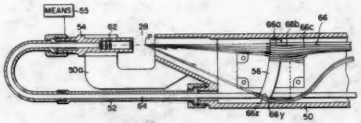
Kyoichi Tatsuno, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 12, 1983, Ser. No. 541,023

Claims priority, application Japan, Oct. 15, 1982, 57-179739; Mar. 25, 1983, 58-49923

Int. Cl.[4] G01N *15/02*

U.S. Cl. 356—336 **18 Claims**



1. A particle diameter measuring device for measuring the particle diameter distribution in a number of particles to be measured, comprising:

a means for irradiating laser beams onto the group of particles to be measured;

a plurality of optical fibers, each receiving scattered light at

a predetermined scattering angle in relation to the laser beam incident direction;

a plurality of photo-detectors, each serving to detect the scattered light guided through each of the optical fibers and convert it into an electric signal;

a means for obtaining a transmission factor t by dividing the intensity of the transmitted light by the intensity of the incident beams;

a means for defining the light path length L in which laser beams are scattered by the particles to be measured;

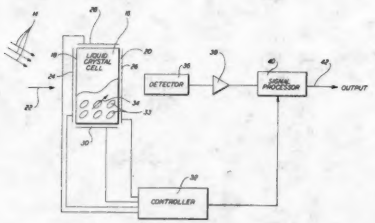
means for adjusting the light path length L in such a way that the transmission factor t becomes not less than 0.6; and

an arithmetic unit for calculating the particles diameter distribution in the form of relative values of particle densities, using the detected scattered light indensity at the predetermined scattering angle.

4,595,292
APPARATUS FOR DETECTING COHERENT RADIATION AND UNEQUAL PATH INTERFEROMETERS

Ralph J. Amodeo, Bethel, and William Krohn, Danbury, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 29, 1983, Ser. No. 518,727
Int. Cl.[4] G01J *9/02*
U.S. Cl. 356—346 **8 Claims**



4. In an unequal optical path length interferometer, a Fabry-Perot etalon comprising a liquid crystal cell having dielectric anisotropic properties, means for applying a time varying electric field vector to said liquid crystal cell to vary the effective index of refraction of said liquid crystal cell in a preselected systematic manner, said means for applying a time varying electric field vector comprises a first electric field applied to said liquid crystal cell in the direction of the optical axis and a second electric field applied to said liquid crystal cell in an orthogonal direction, the electrical potential applied to said electrical fields being varied in a systematic manner so that a vector sum is applied to the cell which rotates with time.

4,595,293
DETECTION OF MOVEMENT OF A CYCLIC INTERFERENCE WAVEFORM, SUCH AS IN A RING LASER GYROSCOPE

John A. Geen, Berkshire, England, assignor to British Aerospace Public Limited Company, London, England

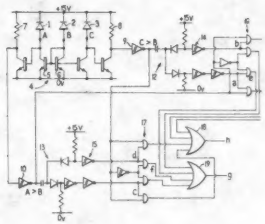
Filed Aug. 26, 1983, Ser. No. 526,871
Claims priority, application United Kingdom, Aug. 26, 1982, 8224584
Int. Cl.[4] G01C *19/64*
U.S. Cl. 356—350 **6 Claims**

1. A ring laser gyroscope of which the rotation indicative output signal forming means includes:

radiation receiving means connected to the gyroscope for receiving and combining respective portions of the counter-rotating components of the gyroscope laser beam to form an interference fringe pattern which moves relative to the gyroscope in dependence upon rotation of the gyroscope about its sensitive axis;

a plurality of photo-sensors supported by the gyroscope at positions defining the extremities of a series of portions of a half-wavelength of the fringe intensity waveform, the photo-sensors being operable to produce output currents indicative of the fringe intensities at respective ones of the extremity positions;

current comparator means comprising a plurality of transistors having collector terminals connected to respective ones of the photo-sensors to receive the output currents therefrom, one of the two transistors which are connected to photo-sensors at the extremities of each said waveform portion having its base terminal connected to its collector



terminal and to the base terminal of the other of the said two transistors for forming at the collector terminal of said other transistor a slope signal indicative of the relationship between the photo-sensor output currents received by the said two transistors and hence indicative of the slope of the associated waveform portion;

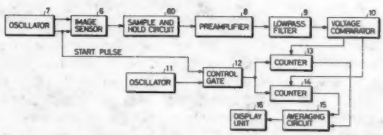
polarity transition sensing means connected to said comparator means for forming polarity transition signals indicative of polarity transitions of the slope signals; and

logic means connected to the comparator means and the polarity transition sensing means and operable for using the slope signals and the polarity transition signals to derive output signals indicative of the amount and direction of movement of the fringe pattern.

4,595,294
POSITION DETECTING DEVICE

Hiroshi Ohki, Tokyo; Kenji Fujii, Chigasaki; Hidehiro Ogawa, Tokyo, and Akio Takahama, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 420,124
Claims priority, application Japan, Sep. 26, 1981, 56-151401
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—375 **7 Claims**



1. In a position detecting device for determining the position of a pattern having a light area and dark area by projecting said pattern on an image sensor provided with a linear array of plural photoelectric converting elements, reading the output signals of said photoelectric converting elements in response to clock pulses of a first frequency, and forming a hold signal by holding the output signals of said photoelectric converting elements during an interval of the clock pulses of said first frequency, thereby determining the position of said pattern on said image sensor; an improvement comprising:

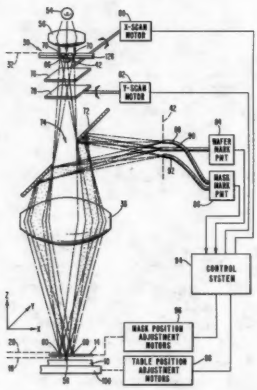
(a) filter means for cutting off the frequency components of said hold signal at least above said first frequency and passing the remaining frequency components of said hold signal as an output signal;
(b) comparator means having a threshold level for comparing the output signal of said filter means with said threshold level and outputting a comparison signal in response to the result of said comparison; and
(c) timer means for measuring the time to the outputting of said comparison signal from said comparator means.

4,595,295

ALIGNMENT SYSTEM FOR LITHOGRAPHIC PROXIMITY PRINTING

Janusz S. Wilczynski, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 337,543, Jan. 6, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 684,432
Int. Cl.[4] G01B *11/27*
U.S. Cl. 356—401 **18 Claims**



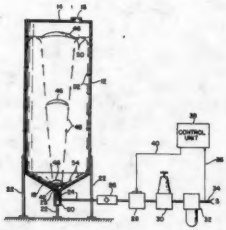
1. Apparatus for aligning a microcircuit wafer with respect to an overlying closely spaced lithography mask, comprising:
a first alignment mark on said microcircuit wafer;
a second alignment mark on said lithography mask, one of said alignment marks defining a first plane and the other of said alignment marks defining a second plane, said first and second planes being parallel and closely spaced;
alignment mask means defining a third plane;
said alignment mask means having a first mask pattern corresponding with said first alignment mark and a second mask pattern corresponding with said second alignment mark;
lens means imaging said first and third planes onto each other;
means for compensating for the difference in position between said first and second planes such that when said wafer and lithography mask are aligned with each other, said lens means images said first mask pattern and said first alignment mark onto each other and at the same time images said second mask pattern and second alignment mark onto each other;
light splitting means positioned between said lens means and said third plane, said light splitting means defining a fourth plane such that said lens means also images said first and fourth planes onto each other, thereby forming first and second bidirectional light propagation paths when said wafer and lithography mask are aligned, said first light propagation path extending from said first mask pattern through said light splitting means and lens means to said first alignment mark and from said first alignment mark through said lens means and light splitting means to a first position optically in the vacinity of said fourth plane, and said second light propagation path extending from said second mask pattern through said light splitting means and lens means to said second alignment mark and from said second alignment mark through said lens means and light splitting means to a second position optically in the vacinity of said fourth plane;
a source of alignment radiation for illuminating one end of said first light propagation path and one end of said second light propagation path;
means for monitoring alignment radiation intensity at the other end of said first light propagation path and alignment radiation intensity at the other end of said second light propagation path; and
means for adjusting the relative position of said wafer and lithography mask until said monitored alignment radiation intensities indicate that said wafer and lithography mask are in alignment.

4,595,296

METHOD AND APPARATUS FOR GAS INDUCED MIXING AND BLENDING

Richard E. Parks, 9207 NE. 24th, Bellevue, Wash. 98004

PCT No. PCT/US85/00181, § 371 Date Feb. 6, 1985, § 102(e) Date Feb. 6, 1985, PCT Pub. No. WO85/03458, PCT Pub. Date Aug. 15, 1985
Continuation of Ser. No. 577,276, Feb. 6, 1984, abandoned. This PCT application Feb. 6, 1985, Ser. No. 709,315
Int. Cl.[4] B01F *13/02*
U.S. Cl. 366—106 **14 Claims**



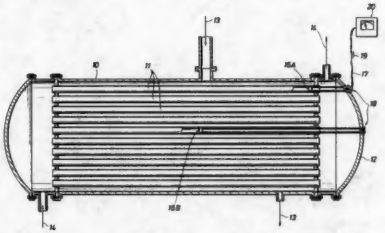
1. A method for air or relatively high pressure induced blending and mixing of liquids and other materials in a container having side and bottom walls, comprising:
(a) locating first compressed air inlet means in close proximity to the bottom of said container at a predetermined location,
(b) introducing compressed air or relatively high pressure in predetermined pulsed quantity and frequency to said container through said air inlet opening, each said pulsed quantity of air being introduced to said container at approximately the same point in time the previous pulsed quantity reaches the surface of the materials in said container,
(c) forming an air bubble from each pulsed quantity of air introduced through said air inlet opening so that substantially discrete, single bubbles of spherical segment shape are formed, and
(d) creating generally circular, vertical toroidal flow patterns within said material such that said material moves upwardly with said bubble and then outwardly in proximity to the surface and then moves downwardly toward the bottom in a continuing, controlled flow pattern for mixing and blending the materials in said container.

4,595,297

METHOD AND APPARATUS FOR MEASURE OF HEAT FLUX THROUGH A HEAT EXCHANGE TUBE

Chih-hsiung F. Liu, and Lynton W. R. Dicks, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 15, 1985, Ser. No. 787,583
Int. Cl.[4] B23P *15/26*; G01K *17/06*; G01N *25/00*
U.S. Cl. 374—29 16 Claims



1. A heat flux meter apparatus for determining the flow of heat through a portion of a surface of a heat exchanger tube, said tube having a central longitudinal axis and a throughbore defined therethrough, the inner wall of said heat exchanger tube being cylindrical in shape and arranged concentric to said central longitudinal axis, said heat flux meter apparatus comprising;

a first hollow cylinder of a selected length formed from a first conductive metal, said first hollow cylinder having an inner diameter and an outer diameter, at least a portion of said outer diameter of said first hollow cylinder operatively contacting the inner wall of said heat exchanger tube,

a second hollow cylinder of a selective length formed from a second thermoelectric conductive metal dissimilar from said first conductive metal, said second hollow cylinder having an inner diameter and an outer diameter, at least a portion of said outer diameter of said second hollow cylinder operatively contacting the inner diameter of said first hollow cylinder,

a third hollow cylinder of a selective length formed from a third conductive metal dissimilar from said second conductive metal, said third hollow cylinder having an outer diameter and an inner diameter, at least a portion of said outer diameter of said third hollow cylinder operatively contacting the inner diameter of said second hollow cylinder, and

electrical connection means operatively contacting said first hollow cylinder and said third hollow cylinder of said heat flux meter apparatus and being capable of placing said first hollow cylinder and said third hollow cylinder in electrical communication via said electrical connection means with an instrument for determining the flow of heat through the heat exchanger tube.

4,595,298

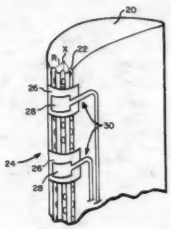
TEMPERATURE DETECTION SYSTEM FOR USE ON FILM COOLED TURBINE AIRFOILS

Robert Frederick, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 1, 1985, Ser. No. 729,388
Int. Cl.[4] G01K *1/08*
U.S. Cl. 374—144 4 Claims

1. Apparatus for measuring the temperature of an annular stream of combustion gases at the leading edge of a film cooled turbine airfoil, comprising:

a film cooled airfoil having a leading edge, said film cooled airfoil having a showerhead assembly defined at said leading edge of said airfoil and including a plurality of parallel slots formed into said leading edge, each of said slots defining a multiplicity of recessed ports in a row, said ports couplable to a cooling air source, and at least one sensor plate assembly, said sensor plate assembly being



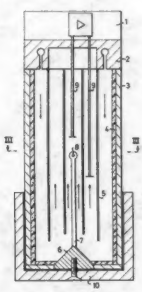
mounted over a portion of said slots of said showerhead assembly and couplable to electronic temperature indicating equipment via signal conductor means attachable therebetween.

4,595,299

APPARATUS FOR CONTACTLESS MEASUREMENT OF TEMPERATURE

Reine Lindwall, Ärenprisvägen 79, S-59062 Linghem, and Leif Samuelsson, Fredriksberg Värna, S-58590 Linköping, both of Sweden

Filed Feb. 22, 1985, Ser. No. 704,225
Claims priority, application Sweden, Feb. 24, 1984, 8401025
Int. Cl.[4] G01K *13/06*, *1/16*
U.S. Cl. 347—153 5 Claims



1. Apparatus for the contactless measurement of the temperature of an elongated, narrow and axially movable object, and in particular for measuring the temperature of wire or wire-rod exiting from a draw plate in a draw bench in a wire drawing process, said apparatus comprising

(a) a closed box having two openings, located in mutually opposite short walls for passage of the object;

(b) two first vertical walls extending substantially parallel with the longitudinal axes of the elongated object and located on opposite sides of the elongated object;

(c) means for organizing an upward flow of gas in a first chamber between the first walls and substantially at right angles to the longitudinal axes of the object;

(d) a first temperature sensor arranged in the upward flow of gas downstream of the object and a second temperature sensor arranged to detect the temperature of the gas flow in an area uninfluenced by the temperature of said object;

(e) wherein the openings have the form of slots located in said short walls, reaching down to a respective end side of

the short walls and enabling the closed box to be straddled over the object; and

(f) wherein outwardly of the first vertical walls and on both sides of said first chamber there are arranged second vertical walls which define between themselves and respective first vertical walls two second chambers, said means for organizing said air flow being arranged to create an upward flow of gas through both said first chamber and said two second chambers, and the second temperature sensor is mounted in one of said second chambers.

4,595,300

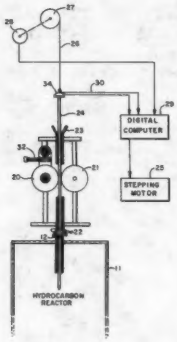
THERMOCOUPLE DRIVE ASSEMBLY

William E. Kaufman, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,325

Int. Cl.[4] G01K *13/00*

U.S. Cl. 374—170 **6 Claims**



1. An assembly for driving a thermocouple into a thermocouple well in a hydrocarbon reactor comprising:

a thermocouple probe;

drive means including two pinch wheels biased to grip said thermocouple probe between them, said drive means being adjacent said thermocouple well for driving one end of said thermocouple probe into said well;

terminals for connecting thermocouple leads to said thermocouple probe;

a reel of supporting cable positioned remote from said thermocouple well, a free end of the cable on said reel being connected to the other end of said thermocouple probe so that said drive means drives said one end of said thermocouple probe into and out of said well to different positions in said reactor to sense the temperature thereof as the cable on said reel is unwound and wound onto said reel;

a transducer driven by said reel, said transducer producing an output indicating the position of said probe in said reactor;

a stepping motor for driving said pinch wheels in controllable increments; and

a digital computer, said thermocouple leads being connected to an input to said digital computer, the output of said transducer being connected to an input to said digital computer, and said digital computer controlling said stepping motor to record temperature measurements at precisely controlled positions in said reactor.

4,595,301

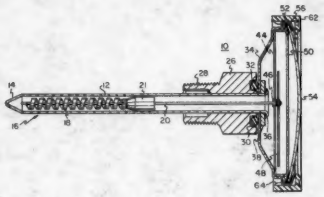
SLIP BEZEL FOR ADJUSTABLE GAUGE

Carl A. Taylor, Carrollton, Tex., assignor to Rochester Gauges, Inc., Dallas, Tex.

Filed Dec. 10, 1984, Ser. No. 679,693

Int. Cl.[4] G01K *1/08, 5/62*

U.S. Cl. 374—207 **11 Claims**



1. A gauge, comprising:

a sensor,

an enclosure for said sensor,

a circular housing rotatably connected to said enclosure,

a dial disposed within said housing,

an indicator needle positioned within said housing, said needle connected to and driven by said sensor, said housing requiring a first force to rotate said housing relative to said enclosure thereby rotating said dial relative to said needle, and

a resilient slip bezel forcibly and detachably mounted on the periphery of said circular housing, said slip bezel having a plurality of spaced means coacting with a portion of said gauge and rotatable around the periphery of said housing in response to a second force which is less than said first force, wherein rotation of said slip bezel does not alter the relationship of said needle to said dial.

4,595,302

BEARING DEVICE FOR WHEEL AXLES

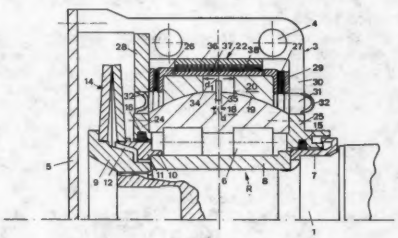
Urs Attinger, Riedt, and Serge Lütschg, Zurich, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 9, 1984, Ser. No. 658,551

Claims priority, application Switzerland, Oct. 17, 1983, 5636/83

Int. Cl.[4] F16C *25/08*

U.S. Cl. 384—558 **15 Claims**



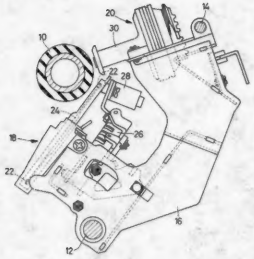
1. Bearing device for wheel set axle shafts having enclosed in an axle bearing housing a wheel bearing comprising an inner ring fitted on the axle and an outer ring aligned with and around the inner ring with roller means between the said rings, and with the inner ring held securely in place by securing means wherein said securing means is a nut screwed onto the said axle shaft, said device including energy storage means comprising a plate spring which is braced against the end nut between the wheel bearing and the axle bearing housing in order to accommodate forces acting on the wheel bearing in the operating position.

4,595,303

PRINTING APPARATUS WITH TWO PRINT HEADS

Susumu Kuzuya, and Mamoru Imaizumi, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 15, 1984, Ser. No. 671,617
Claims priority, application Japan, Nov. 19, 1983, 58-218251
Int. Cl.[4] B41J 3/50
U.S. Cl. 400—82 9 Claims



1. A printing apparatus having a platen to support a sheet of paper and a carrier which reciprocates to print a succession of characters along a line of printing defined on the platen, according to input printing data, said printing apparatus comprising:

paper feeding means for feeding the sheet of paper on said platen in a direction perpendicular to said line of printing;

a first printing assembly supported on said carrier and having type elements adapted to be abuttable on said platen for printing a first group of characters on the sheet of paper along the line of printing, said first printing assembly having a first print point at which the first group of characters are printed by said type elements;

a second printing assembly supported on said carrier for printing a second group of characters on the sheet of paper with a matrix of dots, said second printing assembly having a second print point at which the second group of characters are printed with the matrix of dots, said second print point being spaced from said first print point in a direction along the surface of said platen, said first and second groups of characters including common characters which can be printed by both of said first and second printing assemblies;

first and second control means for controlling the printing operations of said first and second printing assemblies, respectively; and

selector means for receiving said input printing data and for selectively activating said first control means or said second control means to control the operation of said first or second printing assembly, said selector means comprising:

a memory which stores a first and a second group of converted character data corresponding to input character data of said input printing data and which represent said first and second groups of characters;

means for receiving the input character data and reading the corresponding converted character data;

means for determining whether said corresponding converted character data belongs to said first group of converted character data; and

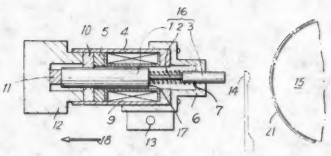
means for activating said first control means when said corresponding converted character data belongs to said first group of converted character data, and activating said second control means when said corresponding converted character data does not belong to said first group of converted character data.

4,595,304

HAMMER ASSEMBLY FOR PRINTERS

Satoshi Fujioka, Shiojiri, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 608,284, May 8, 1984, abandoned. This application Jul. 12, 1985, Ser. No. 755,531
Claims priority, application Japan, May 10, 1983, 58-69390[U]
Int. Cl.[4] B41J 9/06, 9/38
U.S. Cl. 400—157.2 7 Claims



1. A plunger type electromagnetic hammer assembly for impacting onto a platen in a printer comprising:

a housing formed with a yoke having a central elongated opening, said opening having a magnetic flux emitting surface;

coil means for generating magnetic flux inside the central elongated opening of the yoke;

elongated hammer means formed with a plunger portion having a first cross-sectional dimension and an impact heat portion having a second cross-sectional dimension, said plunger portion and said head portion coupled by a neck portion having a third cross-sectional dimension, said third cross-sectional dimension being smaller than said first dimension and than said second dimension, said plunger, neck and head portions being coaxially oriented, the plunger, neck and head portions all being integrally constructed from the same electromagnetic material; and

the distance between the magnetic flux emitting means for reducing flux leakage from said flux emitting surface to the neck portion, said last mentioned means comprising maintaining, said closest surface being directly

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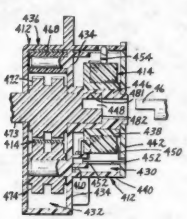
4,595,305

RIBBON CASSETTE

Thomas K. McGourty, and Lawrence F. McGourty, both of Pas Robles, Calif., assignors to Varitronic Systems, Inc., Minneapolis, Minn.

PCT No. PCT/US84/00097, § 371 Date Feb. 17, 1984, § 102(e) Date Feb. 17, 1984, PCT Pub. No. WO85/03260, PCT Pub. Date Aug. 1, 1985
Continuation of Ser. No. 592,018, Feb. 17, 1984, abandoned. This PCT application Jan. 20, 1984, Ser. No. 761,297
Int. Cl.[4] B41J 35/28
U.S. Cl. 400—208 2 Claims

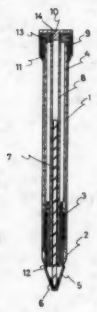


1. A film ribbon cassette for a printer comprising:

(a) a casing having first, second, and third generally parallel

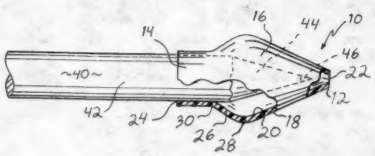
spaced-apart non-rotating walls defining a first tape supply compartment and a second spent tape compartment;
(b) apertures in said first, second and third walls;
(c) a fixed hollow bearing extending orthogonally from said second wall into said first compartment and having its central axis aligned with the center of said apertures;
(d) a tape supply spool having an aperture sized to ride upon said fixed bearing;
(e) a shaft extending from said first compartment within said first bearing through said second compartment, through said aperture in said third wall and outside said cassette, providing a manual advancing knob outside the cassette;
(f) a takeup drive roller concentrically affixed to said shaft and located in said second compartment;
(g) a pinch roller having an axis of rotation parallel to said drive roller and cooperating with said drive roller to feed the ribbon;
(h) means for guiding ribbon from said supply spool outside of said first compartment and into said second compartment and between said rollers;
(i) driving engagement means formed at the end of said shaft within said fixed bearing for receiving and engaging a rotary drive outside said cassette which in turn drive said rollers and advance the ribbon;
(j) a pair of strippers, attached to said cassette at one end and engaging said rollers at their other ends for disengaging spent ribbon from said rollers; and
(k) a ribbon supply sensor and spool engaging member which serves as a means to apply drag to said supply spool, said sensor including a generally semicircular member having an inner concave arcuate surface which directly engages an arc formed on the outer peripheral surface of said ribbon supply spool, said member being affixed at one end to said cassette and including means for biasing said member against said supply spool to provide drag opposing rotation thereof.

4,595,306
PENCIL WITH SHARPENER
Johnstom Hong, 2 Fl., No. 4, Lane 156, Tatung N. Rd., San Chung, Taiwan
Filed Nov. 28, 1984, Ser. No. 675,748
Int. Cl.[4] B43K *29/06, 21/22*
U.S. Cl. 401—50 **1 Claim**



1. An automatic pencil with a lead-sharpening device the pencil comprising a hollow pencil case having a top flange, a hollow head joined to the lower end of the pencil case, a compression spring on top of the head in the pencil case, an outer pipe sleeve positioned above the compression spring with a top which protrudes from the top of the pencil case, a hollow tube extending into the bottom of the head, the hollow tube having an upper end which is threaded to the lower end of the outer pipe sleeve and a lower end which projects from the head and which is slit to form outer jaw mambers, an inner pipe sleeve accommodated in the outer pipe sleeve, the inner pipe sleeve having an upper end which protrudes from the upper end of the outer pipe sleeve and a lower end split into resilient inner jaw members, a cap coupled to the upper end of the inner pipe sleeve, the cap having a skirt with a lower end which is turned in below the top flange of the pencil case, a further compression spring above the pencil case in the cap, a hole in the cap for insertion of a lead into the inner pipe sleeve, a plug for said hole, and lead sharpener elements fixed internally on the respective outer jaw members for sharpening the lead by depression and rotaton of the cap prior to the lead being projected through the outer jaw members by further depression of the cap accompanied by depression of the outer pipe sleeve and hollow tube.

4,595,307
RETRACTABLE IMPLEMENT CLOSURE
Eugene L. Heyden, S. 627 Bernard No. 8, Spokane, Wash. 99204
Filed Nov. 1, 1984, Ser. No. 667,092
Int. Cl.[4] B43K *9/00, 23/00*
U.S. Cl. 401—117 **22 Claims**



1. A retractable closure for an implement having an elongated body portion and at least one end having work performance means, said closure comprising:
an elongated tubular sheath of foldably resilient material defining a wall with an inner wall surface and an outer wall surface, said sheath also having a central axis and a centrally open region therein;
a forward sheath section including forward communication means adapted for axial displacement from a normally enclosing position to an achieved exposing position with respect to said work performance means;
a rearward sheath section including rearward communication means adapted to receive said end and said work performance means therethrough, said rearward sheath section also adapted to form an adherent relation to, and a degree of resistance to displacement from, at least a portion of said implement;
fold means integral with said sheath in the vicinity of said rearward sheath section for adjusting the length of said sheath, said sheath thereby and thereat biased to fold upon itself into a fold bringing a portion of said forward sheath section and a portion of said rearward sheath section in overlapping position, said sheath contracting in length from an enclosing first position to an exposing second position with respect to said work performance means when attached to said implement, said work performance means extending through said forward communication means when so exposed; and,
fold retaining means for retaining said sheath in said exposing second position, said fold retaining means retaining the folded state of said sheath when actuated to achieve said fold.

4,595,308

WRITING INSERT WITH SEALING CAP

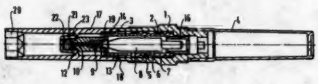
Harald Schiefnetter, Helmbechts; Richard Meyer, Nuremberg, and Rudolf Rosbiegalle, Geroldsgrün, all of Fed. Rep. of Germany, assignors to A. W. Faber-Castell GmbH & Co., Stein bei Nuernberg, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,881

Claims priority, application Fed. Rep. of Germany, Aug. 15, 1983, 3329943

Int. Cl.[4] B43K *9/00, 29/00*

U.S. Cl. 401—243 10 Claims



1. A writing implement, comprising a housing having an end face; a writing insert at least partially arranged in said housing and having a concentric writing tip and a part extending outwardly of said housing; and a closing cap having an inner thread and an annular face, said writing insert having a thread with which it is inserted in said housing so as to form a pressure compensating passage therebetween, said outwardly extending part of said writing insert being provided with abutment faces for cooperating with a tool to screw said writing insert into said housing, said writing insert also having threads cooperating with said inner thread of said closing cap so that said closing cap is screwed not on said housing but on said writing insert, and said end face of said housing abutting against annular face of said closing gap.

4,595,309

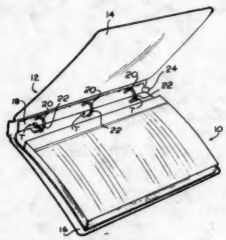
MARGIN EXTENSIONS FOR PADS

Victor M. Chinchar, Two King James South #175, 24650 Center Ridge Rd., Westlake, Ohio 44145

Filed Nov. 30, 1984, Ser. No. 676,631

Int. Cl.[4] B42F *13/00*

U.S. Cl. 402—80 R 3 Claims



1. A margin extension comprising an elongated, flexible planar member having a first longitudinal edge and a second longitudinal edge, said planar member being provided with a plurality of linearly spaced apart round holes adapted to engage a corresponding plurality of rings of a looseleaf binder, said holes being formed substantially equidistantly from said first longitudinal edge; said planar member being provided with a plurality of slit configurations where each of said slit configurations joins an associated hole to said first longitudinal edge, said slit configurations each including a first slit segment which is perpendicular to said first longitudinal edge and which does not intersect said associated hole, and a second slit segment which is parallel to said first longitudinal edge and which connects said first slit segment to said associated hole, such that a flexible tab portion is formed at each hole which extends in a direction parallel to said first longitudinal edge; and attachment means provided proximate said second longitudinal edge and adapted to attach an item to said planar member.

4,595,310

BALL-AND-SOCKET JOINT

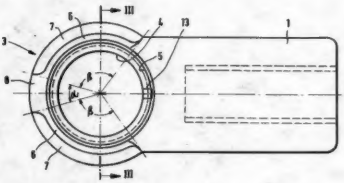
Erich Ausprung, Geislingen, Fed. Rep. of Germany, assignor to Saxonia-Franke GmbH & Co., Göppingen, Fed. Rep. of Germany

Filed Jan. 3, 1985, Ser. No. 688,635

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1984, 3400742

Int. Cl.[4] F16C *11/00;* F16D *1/12*

U.S. Cl. 403—77 23 Claims



1. A socket for a ball-and-socket joint, comprising a head having a spherical cavity, at least one channel connecting said cavity with the atmosphere and a shank extending from said head, said head further having a lateral opening communicating with said cavity to allow for insertion of a ball into or for withdrawal of a ball from said head, the mininum area of said opening being normally less than the maximum cross-sectional area of a ball which fits snugly into said cavity and said head having an external surface provided with recesses surrounding a portion of said opening so as to allow for expansion of said head in the region of said opening.

4,595,311

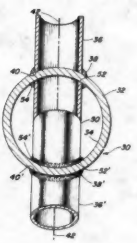
STIFFENING FOR TUBULAR JOINTS

Mamdouh M. Salama, Ponca City, Okla., and Robert B. Pan, Calgary, Canada, assignors to Conoco Inc., Ponca City, Okla.

Filed Aug. 15, 1983, Ser. No. 523,239

Int. Cl.[4] F16B *11/00*

U.S. Cl. 403—271 7 Claims

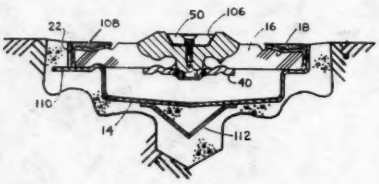


1. In a joint of a tubular chord member having a first diameter and cylindrical inner and outer surfaces and at least one cylindrical bracing member having a second diameter smaller than said first diameter and a longitudinal axis, said bracing member being attached to said outer surface of said chord member, the improvement which comprises a cylindrical tubular internal reinforcing member having a longitudinal axis coincident with said longitudinal axis of each said bracing member, said internal reinforcing member having end surfaces which substantially conform to and are in abutment with said inner surface of said chord member.

4,595,312
PNEUMATICALLY RESTORABLE RETRACTABLE PAVEMENT MARKER AND METHOD OF FABRICATING SAME

Murray B. Corless, P.O. Box 573, 156 Nicoline Avenue, Lucan, Ontario, Canada (N0M 2J0)

Filed Feb. 4, 1985, Ser. No. 697,879
Claims priority, application Canada, Feb. 6, 1984, 446778
Int. Cl.[4] E01F *9/06*
U.S. Cl. 404—11 10 Claims



1. Traffic marker, which comprises a reflector, an elastomeric diaphragm having an outer rim, and a housing, where the diaphragm is clamped between the housing and an annular ring, and sealed to the housing in such manner as to entrap a volume of air between the housing and the diaphragm, and where the reflector is sealed to the diaphragm;

where the ring and the housing are provided with respective complementary interengaging guide surfaces, which are so disposed that the ring and housing may slide relatively upon the guide surfaces in the direction normal to the diaphragm;

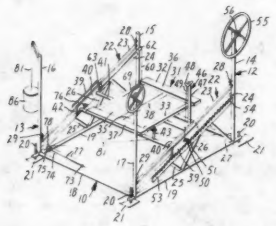
where the ring and the housing are provided with respective complementarily opposed flanges, the flanges being so disposed as to clamp between the flanges with a clamping force the outer rim of the diaphragm when the ring and housing are caused to slide together;

and where the ring is welded to the housing at a pre-determined value of the clamping force on the rim.

4,595,313
BOAT HOIST

Edwin J. Kotke, Rte. 1 Box 191 A, Sarona, Wis. 54870

Filed Jan. 20, 1984, Ser. No. 572,501
Int. Cl.[4] B63C *3/00, 3/08;* B66B *9/20*
U.S. Cl. 405—2 9 Claims



1. A boat hoist, comprising:

a frame having a forward part including a first pair of spaced upright posts, a rearward part including a second pair of upright spaced posts, the posts in said forward and rearward parts being spaced apart to permit the passage of a boat therebetween, an inclined track assembly attached to said frame between said pairs of posts and including spaced opposed parallel tracks deployed at an angle between about 10° and about 45° from the horizontal, said hoist being positionable in a body of water with a lower portion of said track assembly in the body of water and an upper portion of said track assembly above the surface of said body of water; and

a boat platform having a boat-receiving upper surface mounted for movement along said track assembly between a lower position on said track assembly to permit a boat on the surface of said body of water to float over said platform on said track assembly and an upper position on said track assembly where at a boat being supported on said upper boat-receiving surface will be prohibited from floating on the surface of said body of water;

means for moving said boat platform downward along said track assembly;

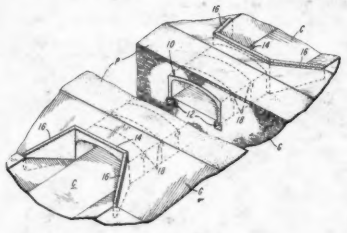
means for moving said boat platform upward along said track assembly; and

means for holding said boat platform at said lower position and at said upper position.

4,595,314
PRECAST CONCRETE CULVERT SECTION

William D. Lockwood, 1563 E. Dorothy La., Dayton, Ohio 45429

Filed Dec. 28, 1983, Ser. No. 566,438
Int. Cl.[4] E01F *5/00*
U.S. Cl. 405—125 10 Claims



4. In a precast concrete culvert section including a pair of parallel spaced vertical concrete side walls having bottom surfaces adapted to rest on corresponding concrete footers, an arcuate concrete top wall integrally connecting said side walls, and said side walls having opposing inner surfaces defining a span greater than the length of said side and top walls, the improvement wherein said arcuate top wall has a generally uniform thickness with a curved inner surface having a radius of curvature at least twice the rise defined between the top center of said cured inner surface and said bottom surfaces of said side walls, each of said side walls having a generally uniform thickness and a flat vertical outer surface with a vertical height at least sixty percent of said rise and less than fifty percent of said radius of curvature, said concrete top wall has a curved outer surface forming a relatively sharp corner with said outer surface of each said side wall, reinforcing members embedded in said concrete and extending generally parallel to said outer surfaces of said top and side walls, and said inner surface of each said side wall and said inner surface of said top wall are connected by a curved surface cooperating with said relatively sharp corner to define a corner thickness substantially greater than the uniform thickness of said side and top walls.

4,595,315
ANCHOR BOLT ASSEMBLY

Hugh M. Gallagher, Jr., Cincinnati, Ohio, assignor to Consolidated Metal Products, Inc., Cincinnati, Ohio

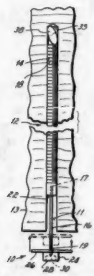
Filed May 30, 1984, Ser. No. 615,219
Int. Cl.[4] E02D *20/02*
U.S. Cl. 405—261 13 Claims

1. An anchor bolt assembly adapted to be secured by an

anchoring cement within a bore formed in a rock structure to strengthen the rock structure comprising:

a shaft having a leading section and a bottom section, said leading section being insertable within said bore and at least a portion of said bottom section extending outwardly from said bore;

a nut disposed on said bottom section of said shaft outwardly from said bore, said nut being bonded by an adhesive to said bottom section;



said shaft leading section being adapted to be advanced into contact with said anchoring cement and rotated by said nut to mix and distribute said anchoring cement within said bore and along said shaft leading section prior to said cement setting, said nut after said cement sets to fix said shaft in said bore being adapted to rotate relative to said fixed shaft to break said adhesive bond with said bottom section, said nut thereafter being adapted to advance along said bottom section for placing said shaft under tension to support said rock structure.

4,595,316

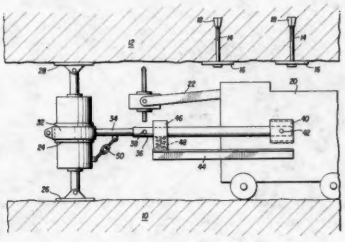
AUTOMATED TEMPORARY ROOF SUPPORT SYSTEM FOR MINING EQUIPMENT

Nelson E. Tinnel, Star Rte. 1, Box 12A, Summersville, W. Va. 26651

Filed May 9, 1984, Ser. No. 608,652

Int. Cl.[4] E21D *15/59, 20/00;* **E21C** *41/00*

U.S. Cl. 405—291 **7 Claims**



1. A temporary roof support system for a low roof mining machine, comprising:

a jack;

a swivel arm fixedly connected to said jack;

a support arm having a first end for receiving said swivel arm and a second end;

said swivel arm and said support arm being relatively rotatable so that said jack may be rotated to a horizontal position in a vertical plane transverse to said support arm;

locking means connected to said support arm and said swivel arm to selectively prevent rotation therebetween;

hinge means fixedly attached to said machine, a second end of said support arm being hingedly received therein;

support means supporting said support arm and being fixedly attached to said machine and extending outwardly beneath said support arm;

whereby said system may be retrofitted to said machine easily and whereby said support plate carries said support arm until said jack is extended.

4,595,317

DEVICE FOR PNEUMATIC AND HYDRAULIC FEEDING OF BULK GOODS

Hermann Möller, Hamburg; Edgar Muschelknautz, Leverkusen, and Jürgen Pust, Wedel, all of Fed. Rep. of Germany, assignors to Johannes Moeller Hamburg GmbH & Co. KG, Hamburg, Fed. Rep. of Germany

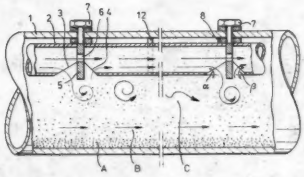
PCT No. PCT/EP84/00265, § 371 Date Jan. 10, 1985, § 102(e) Date Jan. 10, 1985, PCT Pub. No. WO85/01276, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 1, 1984, Ser. No. 700,875

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1983, 3333261

Int. Cl.[4] B65G *53/52*

U.S. Cl. 406—95 **21 Claims**



1. Device for pneumatic or hydraulic feeding of dust-like, powdery or granular bulk goods comprising a feed line forming a main passageway for conveying solid material therethrough, an inner pipe mounted within said feed line, said inner pipe being provided with a plurality of openings providing communication between said inner pipe and said feed line, a disk located within said inner pipe at the location of each opening and extending transversely across the inner pipe to divide each opening into an outlet opening and an inlet opening and at least one opening being provided in each disk.

4,595,318

FORAGE BLOWER HAVING REPLACEABLE WEAR LINER

Kim P. Viesselmann, Grafton, Wis., assignor to GEHL Company, West Bend, Wis.

Filed Jul. 5, 1984, Ser. No. 627,787

Int. Cl.[4] B65G *53/58*

U.S. Cl. 406—97 **2 Claims**

1. A forage blower comprising:

a main frame;

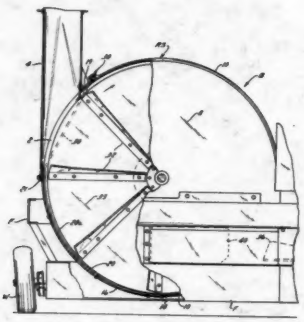
a blower housing mounted on said main frame, said blower housing being generally cylindrical in shape, and having vertically disposed circular sides, a peripheral edge, and having an outlet opening through and near the top of its peripheral edge and an inlet opening through one of its sides;

a rotatable fan mounted within said blower housing; and

a blower outlet transition member movably mounted on said housing, said member being movable between one position wherein it is in communication with said outlet opening and extends upwardly and tangentially from said blower housing and another position wherein it is positioned along one of said sides of said blower housing;

said blower housing comprising:

a pair of circular laterally spaced apart stationary side sheets defining said circular sides;
an annular peripheral rim sheet mounted on and around the peripheral edges of said side sheets,
said rim sheet having spaced apart ends defining said outlet opening in said housing;
a replaceable rim sheet wear liner disposed on the inside of said blower housing adjacent said rim sheet and accessible for replacement through said outlet opening;
releasable fasteners mounted on the exterior of said rim sheet and extending therethrough for releasably attaching said liner in a fixed position on said rim sheet;
adjustable clamping means connected between said spaced apart ends of said rim sheet and having one condition wherein said clamping means clamp said rim sheet in fixed position relative to said side sheets and having another



condition wherein said rim sheet is slidably secured to said side sheets and circumferentially shiftable relative to said side sheets between one position wherein said outlet opening is in an operative position and at least some of said fasteners are positioned on the bottom of said blower housing and inaccessible for release, and another position wherein said some fasteners are positioned at a circumferential side of said blower housing and accessible for release to enable removal or installation of said liner; and
hinge means on said transition member and on said adjustable clamping means for pivotably connecting said transition member to said adjustable clamping means, said hinge means defining a pivot axis disposed along a side of said blower housing, which axis is in a near vertical position when said rim sheet, is in its said fixed position, to enable said transition member to be pivoted between its said positions.

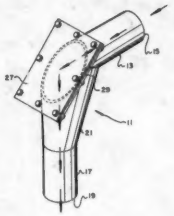
4,595,319

PNEUMATIC CONVEYING SYSTEM ELBOW

Richard H. Cook, Houston, Tex., assignor to Cubeco, Inc., Houston, Tex.

Filed Jun. 4, 1984, Ser. No. 616,734
Int. Cl.[4] B65G *53/52*
U.S. Cl. 406—195 **4 Claims**

1. An elbow for use in paneumatic systems for conveying pelletized plastic products, which comprises:
a cylindrical first leg;
a cylindrical second leg positioned at an angle to said first leg;
a substantially flat impingement plate positioned between said first and second legs at an angle to each of said legs such that pellets traveling substantially parallel to the axis of the first leg are deflected by said impingement plate to travel substantially parallel to the axis of said second leg;
and a funnel section having an enlarged first end connected to said first leg and impingement plate to receive pellets deflected by said impingement plate and a reduced circular second end connected to said second leg, said funnel section having a generally oval cross section in planes



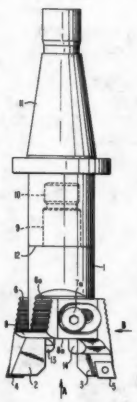
taken perpendicular to the axis of said second leg, with said first end of said funnel section being sized to provide a reduced flow velocity at said impingement plate.

4,595,320

BORING TOOL WITH A DOUBLE CUTTER HEAD, IN WHICH THE WORKING LOAD IS PREVENTED OUTSIDE THE ELASTIC RANGE OF THE CUTTING BIT HOLDER MATERIAL IN THE VICINITY OF THE OUTERMOST RADIAL POSITIONING

Willy Berner; Hans Berger, and Kurt Boller, all of Rupperswil, Switzerland, assignors to Urma AG, Rupperswil, Switzerland

Filed Sep. 19, 1984, Ser. No. 652,744
Claims priority, application Switzerland, Sep. 20, 1983, 5084/83
Int. Cl.[4] B23B *51/00, 29/26*
U.S. Cl. 408—182 **6 Claims**



1. A cutter head assembly comprising
a cutter head having a central axis about which said head is rotated during use;
first and second toothed surfaces on said head facing outwardly away from each other and from said axis, each said toothed surface carrying a linear tooth system in which each tooth lies in a separate plane which is generally perpendicular to said central axis;
first and second bit holders each having a first portion with a linear tooth system slidably engaging said teeth on one of said outwardly facing surfaces so that each bit holder is radially adjustable to a plurality of positions relative to said central axis for adjusting the cutting diameter of said assembly and so that a portion of said head is between said bit holders;

on each of said bit holders including a second portion having means for holding a cutting bit and a third, intermediate portion extending through the central axis between and transversely to said first and second portions to form a generally Z-shaped body;

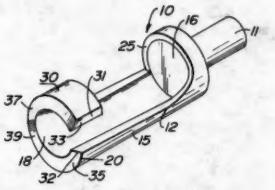
means for clamping each said bit holder to its associated outwardly facing surface in any one of said plurality of radial positions;

means on said first portion of each of said bit holders defining a first contact surface on one side of said central axis facing toward the other bit holder; and means on said second portion of each bit holder on the other side of said central axis from said first contact surface defining a second contact surface facing said first contact surface on the other bit holder, each said first surface on one bit holder and said second surface on the other bit holder being at least partially overlapping and facing each other over substantially the entire range of radial adjustments of said bit holders.

4,595,321
PLUG CUTTER

Leonard Van Dalen, 802 Olive St., Cherry Hill, N.J. 08002

Filed Mar. 28, 1980, Ser. No. 134,971
Int. Cl.[4] B23B *51/04*
U.S. Cl. 408—205 **4 Claims**



1. A plug cutter comprising a shank for powered axial rotation, and a bit extending coaxially from said shank, said bit including a generally cylindrical wall having an open end remote from said shank, said wall tapering externally in the direction away from said remote end and tapering internally in the direction toward said remote end, said wall having a side opening spaced from said remote end and extending at least 180° about said wall, said wall having a longitudinally disposed through slot extending from said side opening and opening through said remote wall end, and an end surface on said remote wall end intersecting with a one side of said slot in an acute angle to define a cutting edge, said end surface being bevelled and extending entirely across the thickness of said wall, said end surface extending from said cutting edge sufficiently to afford relief and thence longitudinally outwardly to a predetermined longitudinal distance inwardly from said cutting edge, for depth control of cut.

4,595,322
SPADE DRILL BIT

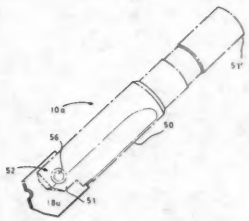
Burke Clement, 7023 Gleason Rd., Westview Towers, Apt. 1214, Knoxville, Tenn. 37919

Continuation-in-part of Ser. No. 430,890, Sep. 30, 1982, Pat. No. 4,503,920, which is a continuation-in-part of Ser. No. 291,640, Aug. 10, 1981, Pat. No. 4,400,119. This application Jul. 6, 1984, Ser. No. 628,587
Int. Cl.[4] B23B *51/02*; E21B *10/44*
U.S. Cl. 408—230 **9 Claims**

1. An improved spade drill bit comprising:

an elongated shank member having a first end for engagement by means to rotate said shank about its axis, and a further end;

a cutter bar having a planar body defining a first end to be releasably carried by said further end of said shank, and a cutting end having oppositely disposed radial edges, said cutting end of said cutter bar having a first and a further surface joined at a chisel point on the axis of said shank, said first and further surface each having a cutting edge and a trailing edge, said first surface being provided with a groove extending from said cutting edge to said trailing edge, the width and depth of said groove at said trailing edge being at least equal to the width and depth of said groove at said cutting edge; and said further surface divided into an inner radial portion and an outer radial



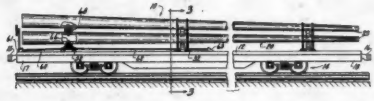
portion, said outer radial portion beginning at a dimension equivalent to substantially that of a radial outer edge of said groove in said first surface, said outer radial portion forming an angle with respect to said axis of said shank less than an angle of said inner radial portion with said axis; and

releasable attachment means associated with said further end of said shank and with said cutter bar for releasably joining said cutter bar to said shank whereby cutting operation is effected by said cutter bar by rotating said shank.

4,595,323
FLOATING LOADING SYSTEM

William M. Howard, 5214 Hedden Cir., Middleton, Wis. 53562

Continuation of Ser. No. 557,475, Dec. 2, 1983, abandoned. This application Oct. 7, 1985, Ser. No. 784,735
Int. Cl.[4] B60D *7/12*; B61D *45/00*
U.S. Cl. 410—36 **3 Claims**



1. A system for attaching a load of elongate utility poles to the surface of a flatbed car consisting essentially of:

a beam member extending across the longitudinal axis of said car and above the surface of said car, said beam member being located near to but spaced apart from a first end of said car;

a plurality of anchor means, said anchor means being located on said surface of said car, a portion of said anchor means being spaced apart from and located on both sides of said beam member;

separate elongate cables secured between each of said anchor means and said beam members;

a plurality of utility poles, each of said utility poles including holes generally adjacent to but spaced apart from a first end of said poles;

holes in said beam member, said holes in said utility poles, and said holes in said beam member being arranged in such a manner that the hole of a particular utility pole is located above a hole in said beam member when said utility pole is supported by said beam member; and

pin means adapted for being inserted into said holes of said

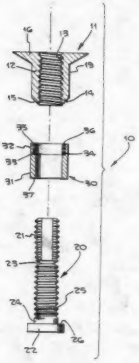
utility poles and said beam member to join said poles to said beam member.

4,595,324

IMPULSE RESISTANT BLIND FASTENER

Shahriar M. Sadri, Los Angeles, Calif., assignor to Monogram Industries, Inc., Culver City, Calif.

Filed Sep. 28, 1982, Ser. No. 425,163
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—38 **4 Claims**



1. In a blind fastener comprising (a) a nut having a nut body with a threaded axial bore therethrough and with a nose at one end and an enlarged head at the other end, and (b) a bolt having a threaded stem extending through said nut and having an enlarged head at one end and a terminal end at the other end, the threads of said bore adapted to mate with the threads of said stem, a breakneck portion on said stem intermediate said terminal end and said enlarged bolt head, and a sleeve of deformable material on said bolt stem between said nut nose and said bolt head, said sleeve being generally cylindrical and smooth-walled on its inner surface,

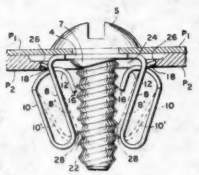
the improvement which comprises said sleeve having a thick wall section adjacent said bolt head and a thin wall section having a thickness less than said thick wall section adjacent said nut nose forming a recess in said thin wall section adjacent said nut nose having a shoulder on the interior of said sleeve at the intersection of said thin wall section with said thick wall section, the external diameter of said sleeve being generally equal to the outer diameter of said nut body, and a collar disposed in said recess having one end generally flush with the end of said thin wall section adjacent said nut nose and the other end abutting against said shoulder, the overall thickness of said collar and said thin wall section being substantially the same as the overall thickness of said thick wall section, the interior of said collar being generally smooth and planar with respect to the interior of said thick wall section, the tensile strength of said collar being substantially less than the tensile strength of said sleeve, the improvement further comprising said bolt stem having an altered thread section adjacent to said bolt head formed by a series of spaced independent straight knurls, substantially parallel to the axis of the bolt, formed in the bolt stem standard threads, which, upon the setting of said fastener, are adapted to interfere with the threading of said nut onto said bolt and the engagement of the thread of said bore with the first mentioned threads of said stem so that the torsional resistance thereto is substantially increased compared to the axial resistance during the completion of said fastener setting thereby preventing premature shearing of the bolt head before break off of the bolt stem at the breakneck portion when the blind fastener is installed in an installation and said sleeve had been forced by said bolt head up over said nut nose until said sleeve engages the installation in which said blind fastener is installed and said sleeve deforms at said collar and thin wall section when said collar and said thin wall section abuts against the installation in which the fastener is installed.

4,595,325

SELF-LOCKING PREVAILING TORQUE FASTENER

Thomas M. Moran, Akron, and Dante A. Laudi, Brooklyn, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 28, 1984, Ser. No. 655,611
Int. Cl.[4] F16B *37/02*
U.S. Cl. 411—173 **3 Claims**



1. A self-locking prevailing torque fastener for inserting into an article opening and securing a threaded member thereto, said fastener comprising:

a base portion having an aperture for receiving the threaded member therethrough that is at least partially surrounded by means for engaging the threads of the threaded member and securing the threaded member to the fastener in response to rotational advancement of the threaded member through the aperture,

a pair of resilient arms extending downwardly and inwardly towards each other from opposite edges of the base portion in a spaced-apart relationship sufficient to enable the threaded member to be received from the aperture therebetween and thence extending outwardly away from each other and upwardly towards the base portion and thence inwardly towards each other and through respective openings disposed in each arm on the side of the base portion facing towards the article opening and thence downwardly away from the base portion to respective free-ends thereof to provide a pair of torque arms that are spaced-apart from each other a distance sufficient to enable their respective engagement with opposite sides of the threaded member received through the aperture therebetween,

a pair of tabs respectively extending from each arm outwardly away from each other in proximity to the respective openings therethrough,

means for registering the fastener tabs with the opposite edges of the article opening when the arms of the fastener are inserted thereon, said tabs dimensionally adapted to respectively engage opposite edges of the article opening upon their respective registration therewith, and

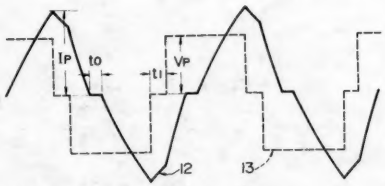
said tabs and said torque arms dimensionally adapted such that when the arms are inserted into the article opening, the tabs respectively press against the opening opposite edges and urge a portion of each torque arm against opposite sides of the threaded member received from the aperture therebetween with sufficient force to apply a force thereagainst that inhibits loosening of the threaded member from the fastener coupled with a substantially equal and opposite force arising from the force exerted by the threaded member in the torque arms that urges the tabs against the respective article opening opposite edges with sufficient force to lock the fastener to the article.

4,595,326

METHOD OF MAKING WELDED CAN BODY

Kenji Matsuno, Yokohama, and Kazuhisa Ishibashi, Tokyo, both of Japan, assignors to Toyo Seikan Kaisha, Limited, Japan

Filed Sep. 7, 1984, Ser. No. 648,214
Claims priority, application Japan, Sep. 9, 1983, 58-165230
Int. Cl.[4] B23K *11/06*
U.S. Cl. 413—1 6 Claims



6. A method of making a welded can body having a mash seam weld which comprises:

(a) forming a can body preform having a side lapped portion from a blank of a surface treated steel sheet without removing the surface treated film thereof from the marginal edges forming the side lapped portion; and

(b) mash seam welding the lapped portion by providing a heat affected zone which is continuous in the longitudinal direction of said weld to assure sealability by using a cooled elongated electrode means and a cooled rotary electrode and wire electrodes interposed between said elongated electrode means and the lapped portion and between the rotary electrode and the lapped portion; while

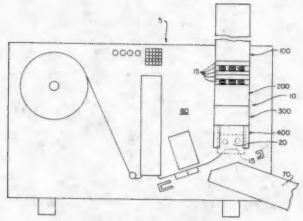
(c) supplying said lapped portion with an alternating current of a modified waveform having a crest factor satisfying the expression $1.5 \leqq I_p/I_e \leqq 2.0$, where I_e and I_p designate an effective value and a peak value, respectively, of said alternating current; with a contact length L (in mm) between said lapped portion and said rotary electrode which satisfies an expression $3 \text{ mm} \leqq L \leqq 10 \text{ mm}$; and a frequency f (Hz) of said alternating current, satisfying an expression $0.054L+0.625 \text{ mm} < P < 0.213L+0.870 \text{ mm}$, wherein a welding pitch P (mm) is defined by an equation $P=v/120f$, where v designates a welding speed (mm/min.).

4,595,327

CASSETTE STORAGE AND FEEDER MECHANISM

George M. Woodley, Shrewsbury, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Sep. 27, 1984, Ser. No. 655,359
Int. Cl.[4] B65G *59/06*
U.S. Cl. 414—126 8 Claims



1. Cassette storage and feeder mechanism for storing a plurality of open end randomly oriented, C-ZERO, non-uniform thickness cassettes and supplying them one at a time to a loading station on a tape winding machine with a uniform open end orientation, said cassette storage and feeder mechanism comprising:

(a) a storage chute having an open bottom end, said storage chute being adapted to slidably constrain a plurality of open end randomly oriented cassettes stacked one on top of another and deliver them one at a time to said bottom end;

(b) gate means disposed at said bottom end of said chute, said gate means being adapted to discharge said cassettes one at a time from said bottom end of said chute without altering said random open end orientation of said cassettes;

(c) orientation means adapted to (a) receive a cassette as it is discharged from said chute, (b) preserve the orientation of each received casette oriented in a first direction, and (c) reverse the orientation of each received cassette oriented in a second opposite direction, said orientation means comprising:

an inclined rotatable platter;

stop means disposed on said platter, said stop means being adapted to (a) maintain a received cassette on said platter if said received cassette is oriented in said second opposite direction, and (b) allow a received cassette to slide off said platter if said received cassette is oriented in said first direction;

platter rotation means adapted to rotate said platter 180 degrees; and

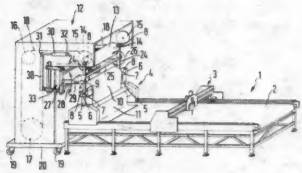
control means for selectively causing said rotation means to rotate, said control means being adapted to operate said rotation means only when a cassette is maintained on said platter, whereby (1) when a cassette oriented in said first direction is received on said platter, it will immediately slide off said platter, and (2) when a cassette oriented in said second direciton is received on said platter, said rotation means will rotate said platter 108 degress so as to orient said cassette in said first direction, whereupon said received cassette will slide off said platter.

4,595,328

APPARATUS FOR TRANSFERRING SUPPORT MEMBERS FOR MATERIAL

Helmut Seitz, Reutlingen, and Herbert Henne, Eningen, both of Fed. Rep. of Germany, assignors to Bullmerwerk G.O. Stumpf GmbH Spezialmaschinenfabrik, Kr. Reutlingen, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,212
Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218544
Int. Cl.[4] B65H *19/12*
U.S. Cl. 414—225 16 Claims



1. Material processing equipment comprising:

a storage station;

a processing station;

open-topped bearing elements in the storage station and the processing station for receiving oppositely projecting support elements of a material support member; and

apparatus for transferring the support member between the storage station and the processing station, the apparatus comprising:

a rotary carrier having a rotary axis,

first and second carrier arms connected to the rotary carrier

and projecting generally radically from the rotary axis in a first direction,

each carrier arm having a receiving portion forming a receiving opening spaced from the rotary axis for receiving support elements of a support member;

a support arm rotatably supporting the rotary carrier;

a parallelogram linkage supporting the support arm for vertical movement to effect lifting and lowering of the rotary carrier, the support arm extending substantially horizontal from the parallelogram linkage; and

drive means to move the rotary carrier about the rotary axis and to displace the support arm to effect lifting and lowering of the rotary carrier to cause the receiving openings to engage support elements of a support member in the bearing elements at one of the stations, raise the rotary carrier to lift the engaged support member from the bearing elements at said one station, further move the rotary carrier about its rotary axis to transfer the engaged support member to a position above the bearing elements at the other station, and lower the rotary carrier to lower the support elements of the support member onto the bearing elements at that other station.

6. Apparatus for transferring a material support member between a material storage station and a material processing station, the support member comprising oppositely projecting support elements for engagement with open-topped bearing elements provided at the storage and processing stations, the apparatus comprising:

a support frame including first and second spaced apart support arms, a first bracket secured to the first support arm in a fixed position relative thereto, and a second bracket secured to the second support arm in a fixed position relative thereto;

a carrier shaft having a rotary axis and extending between and rotatably supported by the first and second brackets;

first and second carrier arms connected to the carrier shaft and projecting generally radially from the rotary axis in a first direction;

third and fourth carrier arms connected to the carrier shaft and extending diametrically opposite the first and second carrier arms for the same distance from the rotary axis as said first and second carrier arms;

each carrier arm having a receiving portion forming a receiving opening spaced from the rotary axis for receiving a support element of a support member;

carrier drive means mounted on one of said support arms and conected to the carrier shaft to rotate the carrier arms between a first position wherein the first and second carrier arms extend upward from the rotary axis and the third and fourth carrier arms extend downward therefrom, and a second position wherein the first and second carrier arms extend downward from the rotary axis and the third and fourth carrier arms extend upward therefrom, to cause the receiving opening of the first and second carrier arms to engage support elements of a first support member in the bearing element at the material storage station and subsequently transfer the first support member to a position above the bearing elements of the material processing station, and to cause the receiving openings of the third and fourth carrier arms to engage support elements of a second support member in the bearing elements at the material processing station and subsequently transfer the second support member to a position above the bearing elements of the material storage station; and

support arm drive means connected to the support frame to raise and lower the support arms and the carrier shaft to lift the support members from, and subsequently lower the support members onto, the bearing elements at the material processing and storage stations.

4,595,329

PROCESS AND INSTALLATION FOR STORING OBJECTS WITH AUTOMATED HANDLING

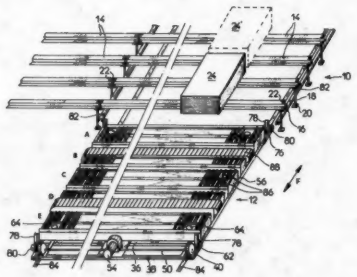
Michel J. M. Marqués, Soisy-S/Montmorency, France, assignor to Cabinet Brot, Paris, France

Filed Oct. 6, 1983, Ser. No. 539,539

Claims priority, application France, Oct. 28, 1982, 82 18108

Int. Cl.[4] B65G *1/04*

U.S. Cl. 414—267 **23 Claims**



1. An installation for storing objects comprising:

a storage area having at least one level including a plurality of horizontal and parallel, transversely extending beams spaced apart a uniform distance, and means supporting the beams;

a passage track longitudinally extending directly beneath the beams;

a mechanized handling vehicle for moving loads along the beams and supported on the passage track for movement therealong to positions directly beneath the beams, the handling vehicle including

(i) a motorized chassis supported on the passage track,

(ii) a lifting cradle resting on the chassis and having a low position, wherein the cradle passes freely under the beams, and a high position for lifting a load off the beams, and

(iii) load carrier means connected to the cradle and supported thereby for movement relative to the cradle to engage the load and carry the load in the transverse direction along the cradle and the beams.

4,595,330

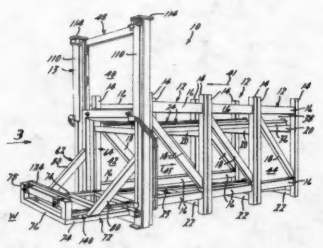
MATERIAL STORAGE AND DELIVERY SYSTEM

Michael J. O'Brien, 227 Oneida, Pontiac, Mich. 48053; Francis V. Palazzolo, 35707 Alta Vista, and Wayne T. Polachowski, 35731 Alta Vista, both of Sterling Heights, Mich. 48077

Filed Jun. 13, 1984, Ser. No. 620,165

Int. Cl.[4] B65G *65/02*

U.S. Cl. 414—276 **21 Claims**



1. A container storage and delivery system for accumulating

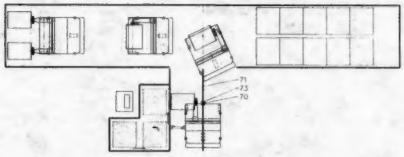
and storing workpiece containers and for delivery said workpiece containers to a work station comprising, a support structure defining a container loading station and a container unloading station, a first set of elongated flow rails communicating with said container loading station and supported in an inclined fashion by said support structure to define a first container pathway extending downwardly from said container loading station, said containers being positioned on said first set of flow rails at said container loading station, said first set of flow rails being operative to support said containers for flow along said first container pathway by way of gravity from said container loading station to facilitate storage and accumulation of said containers along said first container pathway, a second set of elongated flow rails communicating with said container unloading station and supported in an inclined fashion by said support structure to define a second container pathway for accumulating and storing said containers, said second set of flow rails being operative to support said containers for flow along said second container pathway by way of gravity toward said container unloading station, a container transfer mechanism operative to index and transfer said containers from said first container pathway to said work station, said transfer mechanism associated with said support structure such that said containers flow from said first set of flow rails onto said transfer mechanism, means associatead with said container transfer mechanism for pivoting said transfer mechanism about an axis from a normal, substantially horizontal, resting position to a container access position at said work station, and said transfer mechanism having a second means associated with said container transfer mechanism for pivoting said transfer mechanism about a second axis from said normal resting position to an indexing position for moving and indexing said containers from said work station to said second container pathway for gravity flow therealong in the direction of said container unloading station.

4,595,331

AUTOMATED RAILCAR LOADER AND METHOD

Roger A. Thompson, Littleton; Davey L. McCullough, Golden; Larry M. Dugan, Boulder, and Lewis R. Branch, Golden, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Dec. 29, 1983, Ser. No. 566,891
Int. Cl.[4] B65G *67/20*
U.S. Cl. 414—347 **49 Claims**



1. A system for automatically loading a transport vehicle with unit loads by automatically moving said unit loads from a predetermined loading position to prescribed positions in said transport vehicle comprising:

staging means for precisely positioning said unit loads in said predetermined loading position;

loading vehicle means for receiving said unit loads from said predetermined loading position and placing said unit loads in said prescribed positions in said transport vehicle;

stage processor means for producing placement signals indicative of placement of said unit loads in said prescribed positions in said transport vehicle;

communication means for transmitting said placement signals from said stage processor means to said loading vehicle means;

sensor means for producing translational and operational sensor signals to indicate translational and operational movements of said loading vehicle;

loading vehicle processor means for producing steering control signals to guide said loading vehicle means along a predetermined path internally generated by said loading vehicle processor means in response to said translational sensor signals and said placement signals, and for producing operational movement signals in response to said operational sensor signals and said placement signals to receive said unit loads from said staging means and placing said unit loads in said prescribed positions;

wherein said loading vehicle means comprises:

plate means for carrying said unit loads;

plate handling means for moving said plate means in response to said operational movement signals;

wherein said sensor means comprises:

loading vehicle sensor means disposed on said loading vehicle means for detecting said translational movements of said loading vehicle means and said operational movements of said plate means;

wherein said loading vehicle sensor means comprises:

absolute position sensor means coupled to said plate handling means for producing plate position signals indicative of said operational movements of said plate means in longitudinal, transverse, rotational and vertical directions;

unit load removal means for responding to a unit load removal signal to remove said unit loads from said plate means and place said unit loads in said prescribed positions by pushing said unit loads from said plate means with a substantially uniform pressure sufficient to move said loading vehicle means away from said unit loads and place said unit loads in said prescribed positions in said transport vehicle;

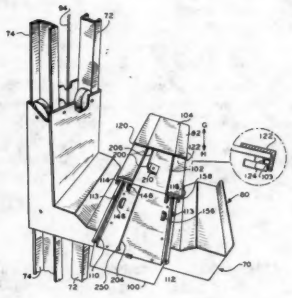
pressure sensor means for producing pressure signals indicative of pressure generated between said unit load removal means and said unit loads during removal of said unit loads from said plate means by said unit load removal means to maintain said substantially uniform pressure.

4,595,332

SHUTTLE

Weston R. Loomer, Florence, Ky., assignor to Litton Systems, Inc.

Filed Jun. 15, 1983, Ser. No. 504,416
Int. Cl.[4] B66F *9/14*
U.S. Cl. 414—663 **12 Claims**



1. A telescoping shuttle; comprising:

(a) shuttle base means;

(b) first table means carried by said shuttle base means for movement with respect to said shuttle base means along a predetermined path between a first position and a second position;

(c) second table means carried by said first table means for movement with respect to said first table means between a third position and a fourth position;

(d) first sheave means rotatably mounted on said first table means by first mounting means;

(e) first flexible member means having a first end connected to said shuttle base means at a first predetermined location thereon and extending therefrom around at least a portion of said first sheave means and having a second end connected to said second table means at a first predetermined location thereon;

(f) second sheave means rotatably mounted on said first table means in aligned but spaced relationship to said first sheave means by second mounting means;

(g) second flexible member means having a first end connected to said shuttle base at a second predetermined location on said shuttle base, and extending therefrom around at least a portion of said second sheave means and having a second end connected to said second table means at a second predetermined location thereon spaced from said first predetermined location on said second table means;

(h) said first mounting means and said second mounting means each comprising flap means formed from the material of said first table means and disposed at a predetermined angle with respect thereto;

(i) said flap means of said first mounting means and said flap means of said second mounting means each comprising a pair of flaps spaced one from the other in substantially parallel relationship to form therebetween a place to rotatably mount the respective first and second sheave means;

(j) said first table means including a first table plate and a second table plate with each of said table plates having formed from the material thereof one of said flaps of said first mounting means and one of said flaps of said second mounting means;

(k) said first table plate and said second table plate each including a first substantially planar surface and a second substantially planar surface and said flaps each extending at a predetermined angle from said first planar surfaces; said first table means being formed by placing said second planar surface of said first table plate in juxtaposition to said second planar surface of said second table plate and with their respective flaps aligned one with the other; attaching means to secure said first table plate to said second table plate;

(l) said first mounting means and said second mounting means rotatably mounting their respective sheaves at said predetermined angle;

(m) said positioning of said first and second sheave means, and said connections for said first and second ends of said first and second flexible member means being selected so that movement of said first table means with respect to said shuttle base in a predetermined direction will produce a movement of said second table means with respect to said first table means in a corresponding direction but at a rate of movement which is a predetermined multiple of the rate of movement of said first table means; and

(n) shuttle drive means coacting with said first table means to move same with respect to said shuttle base means.

4,595,333

HAND APPARATUS OF A ROBOT

Takashi Ono, Chigasaki, and Kazuhiko Otsubo, Yamato, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,271
Int. Cl.[4] B25J *15/00*
U.S. Cl. 414—729 **4 Claims**

1. A hand apparatus of a robot, comprising:

a wrist;

a main frame;

damper coupling means resiliently mounting said main frame on said wrist member;

a pair of four-point-articulated link arms each pivotally mounted on said main frame;

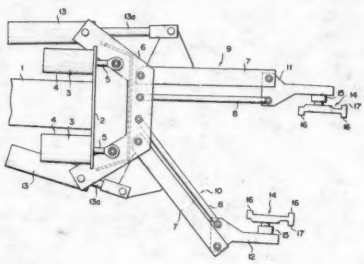
a pair of sub-frames each pivotally mounted on said respective link arms;

a pair of finger means each pivotally mounted for movement in every direction on said respective link arms;

a pair of hydraulic cylinder means each including a cylinder and a piston rod and defining a head end chamber and a rod end chamber therein, said cylinder being pivotally connected to said main frame and said piston rod being pivotally connected to said respective link arms; and

means for selectively supplying pressurized fluid to said head end and to said rod end chambers;

said damper coupling means comprises:



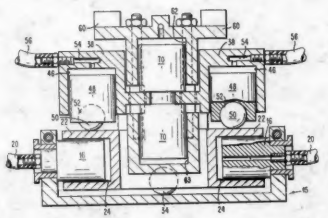
a plurality of damper couplings each comprising a cylindrical member having end walls fixedly secured on said wrist member, an internally concave spherical bushing slidable mounted within said cylindrical member, a partly spherical ring member rotatably received within said internally concave spherical bushing, a holder member mounted in said spherical ring member, said holder member having two flanges sandwiching said spherical ring member therebetween, a first and a second spring each mounted between one of the flanges and one of the end walls of said cylindrical member, and a rod inserted in said holder member, said rod having one end coupled to said holder member and the other end pivotally coupled to said main frame.

4,595,334

ROBOTIC APPARATUS WITH IMPROVED POSITIONING ACCURACY

Andre Sharon, Stamford, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1984, Ser. No. 572,086
Int. Cl.[4] B66C *1/00;* **B25J** *11/00, 15/00, 17/02*
U.S. Cl. 414—735 **10 Claims**



1. In a robotic apparatus which includes a primary robot provided with a manipulator means to support and displace a holder, a locating sensor to detect the relative position of said holder, the improvement comprising

a secondary robot mounted on said manipulator means and supporting said holder, said secondary robot separately adapted to move said holder through at least five degrees

of movement in response to output from said locating sensor,

a mounting plate,

a first stage platform movably supported on said mounting plate, a first means to support and rotate said first stage platform relative to said mounting plate about a translational axis X and also move said first stage platform longitudinally in the X direction,

a second stage platform movably supported on said first stage platform, a second means to support and rotate said second stage platform relative to said first stage platform about a translational axis Y and also move said second stage platform longitudinally in the Y direction,

a third stage platform movably supported on said second stage platform, a third means to support and move said third stage platform in a Z direction relative to said second stage platform

said locating sensor providing input to control movement of said first stage platform, said second stage platform, and said third stage platform to provide a precise positioning of said holder.

4,595,335

PICK AND PLACE UNIT

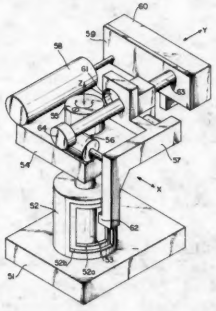
Naoki Takahashi, Yokohama; Osamu Higuchi, Ibaragi; Seii Miyakawa, Yokohama; Masahito Uno, Chigasaki, and Hiroshi Sato, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,788

Claims priority, application Japan, Aug. 25, 1982, 57-146154; Dec. 24, 1982, 57-226035

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—744 R **21 Claims**



1. Apparatus comprising:

a first member,

a second member movably mounted relative to said first member,

first drive means for repeatedly moving said second member relative to said first member along a path,

first abutment means supported by said first member,

second abutment means supported by said second member to limit the movement of said second member in at least two different ranges of substantial movement along the path relative to said first member in combination with said first abutment means,

second drive means for moving one of said abutment means relative to the other said abutment means to select one of said ranges of said movement of said second member relative to said first member

said second abutment means limiting the movement of said second member at both of the ends of each of said ranges along the path of said second member,

said second drive means moving said one abutment means in a direction crossing said path, and

one of said abutment means having two bores different in width and the other of said abutment means having at least one stator which is such width to be passed through only one of said two bores to limit the movement of said second member relative to said first member in combination with said two bores different in width.

4. Apparatus comprising:

a first member,

a second member movably mounted relative to said first member,

first drive means for repeatedly moving said second member relative to said first member along a path,

first abutment means supported by said first member,

second abutment means supported by said second member to limit the movement of said second member in at least two different ranges of substantial movement along the path relative to said first member in combination with said first abutment means,

second drive means for moving one of said abutment means relative to the other said abutment means to select one of said ranges of said movement of said second member relative to said first member

said second abutment means limiting the movement of said second member at both of the ends of each of said ranges along the path of said second member, and

said one of said abutment means having stepped slot ends which have slot ends different in width and the other of said abutment means having a projector movable to change the limit of the movement of said second member in combination with one of said slot ends.

4,595,336

WIND POWERED APPARATUS

David L. Grose, Wichita, Kans., assignor to Solartech Energy and Research Corporation, Topeka, Kans.

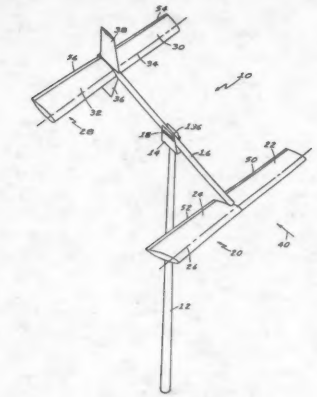
Division of Ser. No. 393,068, Jun. 28, 1982, Pat. No. 4,470,770. This application Aug. 17, 1984, Ser. No. 641,604

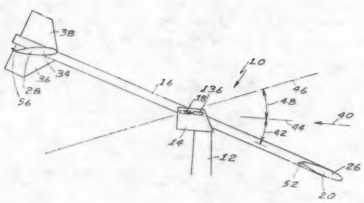
Int. Cl.[4] F03D *5/06*

U.S. Cl. 416—82 **27 Claims**

10. In apparatus for extracting energy from a moving fluid of the class that includes an elongated member mounted for rocking movement between limiting positions about a pivotal axis and a wing pivotally mounted on the member about a wing axis spaced from and substantially parallel to said pivotal axis for movement between positive and negative angles of attack with respect to ambient fluid flow for respectively urging pivotal movement of the member in first and second directions, the improvement comprising said wing being free for oscillatory movement about said wing axis and a control panel pivotally mounted on the wing for movement between first and second positions relative thereto that are respectively operative to subject the wing to oppositely directed moments about its free oscillatory wing axis whereby the wing is urged respectively toward its positive and negative angles of attack in response to the control panel being disposed at its first and second positions, said wing, said control panel and said wing axis being so constructed and arranged to obtain a torsion-free mode of operation, and control means actuated by oscillation of said member for reversing the position of the control panel in response to the member approaching either of its limiting

positions while otherwise opposing change of control panel position, whereby the direction of rocking movement of the





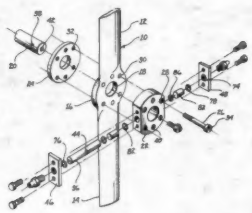
member is reversed solely when the member approaches its limiting positions.

4,595,337

HUB FOR WIND MACHINES

Scott D. Crowe, 45 Jody La., Camarillo, Calif. 93010

Filed Dec. 20, 1984, Ser. No. 684,096
Int. Cl.[4] F04D *29/08, 29/36*
U.S. Cl. 416—131 **7 Claims**



1. Apparatus for maintaining lubricated a teeter pin supporting a fan blade hub upon a rotatable shaft, said apparatus comprising in combination:

(a) a pair of aligned spaced apart journals diametrically disposed within the hub for receiving opposed ends of the teeter pin;

(b) a pair of plates, one plate of said pair of plates being located at the radial extremity of each journal of said pair of journals for closing the respective end of the respective journal;

(c) means disposed in each plate of said pair of plates for introducing a lubricant into the respective journal of said pair of journals to lubricate in a direction radially inwardly the journaled part of the teeter pin; and

(d) seal means disposed proximate the radially inward end of each journal of said pair of journals and adjacent the journaled teeter pin for restraining radially outward flow of foreign matter intermediate the teeter pin and each journal of said pair of journals;

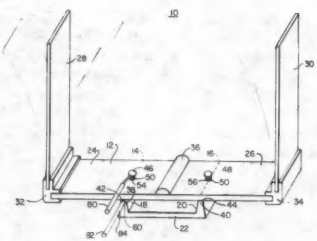
whereby, said pair of plates restrain loss of lubricant due to dynamic forces acting upon the lubricant and said seal means inhibit incursion of foreign matter intermediate the teeter pin and said pair of journals due to dynamic forces.

4,595,338

NON-VIBRATIONAL OSCILLATING BLADE PIEZOELECTRIC BLOWER

Henry H. Kolm, Wayland, and Robert E. Carter, Auburndale, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Filed Nov. 17, 1983, Ser. No. 552,972
Int. Cl.[4] F01D *1/16*
U.S. Cl. 416—81 **22 Claims**



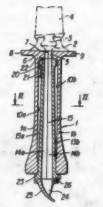
1. A non-vibrational oscillating blade piezoelectric blower comprising: a piezelectric bender having at least two spaced inertial nodes; means for supporting said piezoelelctric bender at each of said inertial nodes; and a flexible blade mounted to said piezoelectric bender remote from said nodes and driven to oscillate by said piezoelectric bender.

4,595,339

CENTRIPETAL ACCELERATOR FOR AIR EXHAUSTION IN A COOLING DEVICE OF A GAS TURBINE COMBINED WITH THE COMPRESSOR DISC

Jacky Naudet, Bondoufle, France, assignor to Societe Nationale d'Etude et de Construction de Meteurs d'Aviation S.N.E.C.-M.A., Paris, France

Filed Sep. 6, 1984, Ser. No. 647,635
Claims priority, application France, Sep. 21, 1983, 83 14975
Int. Cl.[4] F01D *5/08*
U.S. Cl. 416—95 **3 Claims**



1. A compressor disc assembly, comprising: p1 a first half disc;

a second half disc secured to the first half disc and which in

combination define a space having orifices at a rim portion thereof for bleeding air;

a centripetal accelerator device detachably mounted within said space of the half discs and communicating with the orifices, wherein said device further comprises

a plurality of sectors mounted in an annular array within said space, wherein each of said sectors includes a first half shell, a second half shell and a plurality of ribs located on the half shells which respectively form a plurality of centripetal blades and which serve to connect the half shells together and wherein each of said sectors are substantially of a trapezoidal form;

a locking member attached to each of said sectors; and

a body of revolution including a deflector engaged with said locking member for discharging air towards an exit of said centripetal accelerator, wherein radial inner edges of said sectors respectively receive said deflector and wherein said sectors have generally radial edges, the angles of at least some of which, relative to a radial line extending from a center of said disc assembly, differing from one another.

4,595,340

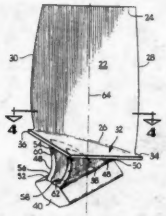
GAS TURBINE BLADED DISK ASSEMBLY

David D. Klassen, Boxford, and Douglas B. Ballantyne, Marblehead, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Jul. 30, 1984, Ser. No. 635,958

Int. Cl.[4] F01D *5/30*

U.S. Cl. 416—193 A **21 Claims**



1. A gas turbine engine blade comprising:

an airfoil having a root;

a shank extending from said airfoil root; and

a dovetail extending from said shank;

said shank having two oppositely facing lateral surfaces, and first and second oppositely facing end surfaces, said lateral surfaces being wider than said end surfaces, and said shank second end surface including a pocket extending therein toward said shank first end surface and between said dovetail and said airfoil root, said pocket defining first and second laterally spaced and longitudinally extending legs, said shank including a solid forward portion extending from said first surface to said pocket, said airfoil being generally aligned with respect to a longitudinal axis of said blade along substantially only said first leg and said solid forward portion for providing a generally straight load path from said airfoil to said dovetail.

4,595,341

FLUID SUPPLY APPARATUS INCLUDING PLURAL RESERVOIRS AND CONDITION RESPONSIVE CONTROL OF PUMP DRIVE MOTOR BY CONTAMINANT SENSING PROBES

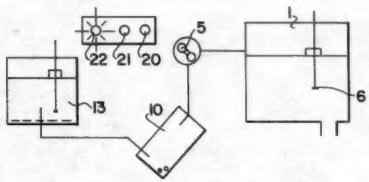
John V. Castell-Evans, Toddington, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed Jul. 3, 1984, Ser. No. 627,620

Claims priority, application United Kingdom, Jul. 6, 1983, 8318255

Int. Cl.[4] F04B *49/00, 21/00*

U.S. Cl. 417—1 **9 Claims**



1. Fluid supply apparatus comprising: a first fluid reservoir; a second fluid reservoir; a fluid connection between the two reservoirs; an intermediate tank disposed in the fluid connection between the two reservoirs; a pump disposed in the connection for pumping fluid from the first to the second reservoir; probes in the first fluid reservoir and in the intermediate tank for sensing the presence of an electrically conductive contaminant; and control circuitry for preventing operation of the pump when a containment is sensed.

4,595,342

DEVICE FOR THE CONTROL OF A FLUID PRESSURE OF A TURBOMACHINE ENGINE AND SUPPORT FOR A PRESSURE PICK-OFF

Jan Christlieb, Waldweg 34, DE-2171 Todendorf, and Karl Müller, Mozartweg 3, DE-2351 Trappenkamp, both of Fed. Rep. of Germany

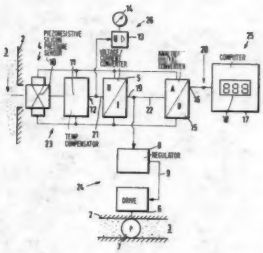
PCT No. PCT/DE83/00096, § 371 Date Jan. 27, 1984, § 102(e) Date Jan. 27, 1984, PCT Pub. No. WO83/04286, PCT Pub. Date Dec. 8, 1983

PCT Filed May 25, 1983, Ser. No. 577,627

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220467; May 29, 1982, 3220466; Sep. 29, 1982, 3235947

Int. Cl.[4] F04B *49/06*

U.S. Cl. 417—45 **5 Claims**



1. An arrangement for controlling the pressure of a fluid being pumped by a pump driven by a drive means, said arrangement comprising:

(a) a piezoresistive silicon pressure sensing means (4) responsive to the fluid, said pressure sensing means having a piezoresistive silicon pressure sensor (31) mounted in a

support (27, 28, 59, 60, 61), said support comprising two interconnected support parts (29, 29, 62, 62, 63, 63, 64, 64) which can be rotated about their common central axis (34) by a predetermined angle for setting the maximum measurable pressure difference on said pressure sensor (31), said support parts having in their interconnected faces (35, 35) central recesses (38) for receiving said pressure sensor (31), said recesses being connected by means of channel-like openings (41, 41) and channels (33) to the exterior of said support parts (29, 29, 62, 62, 63, 63, 64, 64), at least one channel-like passage (36, 37) extending between said channel (33) and face (35) of each support part (29, 29, 62, 62, 63, 63, 64, 64), said channel-like passage (36, 37) having a larger cross section than that of said opening (41), the aperture (39, 40) of said channel-like opening (36, 37) in said faces (35) being spaced from recesses (38);

(b) a temperature compensator (11) connected to said pressure sensing means;

(c) a voltage/current converter (5) operable by the temperature-compensated output signal of said pressure sensing means;

(d) regulating means (8) coupled to the output of said voltage/current converter (5) and couplable to the drive means (6) of the pump (7) for controlling the drive means responsive to said output signal;

(e) an A/D converter (15) coupled to the output of said voltage/current converter;

(f) an electronic computer (17) coupled to said A/D converter (15) for processing and displaying test values;

(g) and analog display means (14) coupled to said temperature compensator (11).

4,595,343

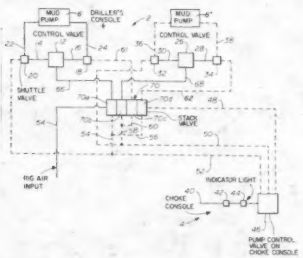
REMOTE MUD PUMP CONTROL APPARATUS

Steven R. Thompson, Moore, and William D. Harbour, Jr., Norman, both of Okla., assignors to Baker Drilling Equipment Company, Orange, Calif.

Filed Sep. 12, 1984, Ser. No. 649,705

Int. Cl.[4] F04B *21/00*; E21B *47/00*

U.S. Cl. 417—53 **17 Claims**



1. Apparatus for controlling the circulation of fluid in a subterranean well comprising:

a pump;

a choke communicable with the pump;

pump monitoring means for regulating the pump speed to vary the flow rate of the circulating fluid;

choke monitoring means located at the surface of the well remote from the pump monitoring means and including choke regulating means for varying the fluid flow area through the choke to control the pressure of the circulating fluid as the flow rate is changed by variations in the pump speed; the improvement comprising:

a second pump control means incorporated in the choke monitoring means and communicable with the pump through the pump monitoring means for regulating the pump speed.

16. A method for use in controlling the circulation of drilling fluid between the surface and the borehole of a subterranean well from a choke monitoring console proximate to a choke and remote from a pump and from a drilling monitoring console on a drilling rig, comprising the steps of:

controlling the pump from the drilling monitoring console and the choke from the choke monitoring console in the absence of an overriding signal from the choke monitoring console to the drilling monitoring console;

overriding control of the pump by the drilling monitoring console by transmitting an overriding signal to the drilling monitoring console from the choke monitoring console; and thereafter,

controlling both the pump and the choke from the choke monitoring console.

4,595,344

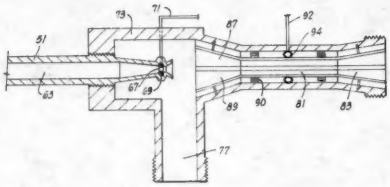
EJECTOR AND METHOD OF CONTROLLING SAME

Patrick B. Briley, 208 NW. 44th, #F, Lawton, Okla. 73505

Filed Sep. 30, 1982, Ser. No. 429,279

Int. Cl.[4] F04F *5/48*

U.S. Cl. 417—185 **2 Claims**



1. An adjustable ejector for adjustably controlling fluid flow conditions resulting from fluid flow through the ejector comprising:

an ejector housing having therein a motive inlet including an inlet nozzle, a suction inlet, and a mixing and outlet zone wherein mixing of fluid from said motive inlet and said suction inlet occurs and then exits from the ejector, including a mixing throat;

adjustment means for varying the fluid presentation size of said inlet nozzle and of said mixing throat such that fluid flow conditions with respect to said motive inlet, suction inlet, and mixing and outlet zone can be controlled thereby, said adjustment means including an adjustable fluid path structure disposed in each of said inlet nozzle and said mixing throat, said adjustable fluid path structure of said inlet nozzle comprising;

an inflatable torus capable of inflation and deflation by hydraulic fluid and disposed for receiving and conveying fluid passing into and through said inlet nozzle;

an hydraulic conduit extending from said hydraulic torus for conveying hydraulic fluid to and from said torus; and

means for pumping hydraulic fluid through said conduit to and from said torus for inflating and deflating said torus.

4,595,345

GAS COMPRESSOR OR BLOWER

John M. J. Varga, 2 Lawrence Rd., Skircoat Green, Halifax, West Yorkshire, United Kingdom

Division of Ser. No. 448,414, Dec. 19, 1982, Pat. No. 4,499,814, which is a continuation of Ser. No. 112,116, Jan. 14, 1980, abandoned. This application Nov. 20, 1984, Ser. No. 673,501

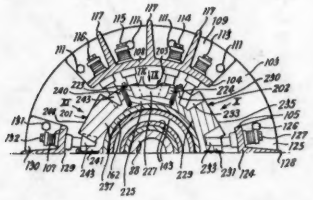
Claims priority, application United Kingdom, Jan. 15, 1979, 7901415

Int. Cl.[4] F04B *7/06, 34/10*

U.S. Cl. 417—500 **14 Claims**

1. A gas compressor or blower comprising cylinder means; piston means rotatably and reciprocably mounted in the cylinder means; ports spaced around the circumference of the piston

means for cooperating with the ports spaced around the circumference of the cylinder means to admit gas into and exhaust gas from at least one chamber lying to one side of the piston means; a piston shaft to which the piston means is secured, the piston shaft passing through seals at the axial ends of the cylinder means; and means for driving the piston shaft to rotate and reciprocate relative to the cylinder means, the arrangement of ports being such that as the piston rotates and reciprocates gas is induced into the chamber, is compressed in the chamber and



then exhausted from the chamber; characterised in that each of the ports on a first one of the piston and cylinder means has associated sealing means forming a continuous barrier around the periphery of the associated port and mounted to confront the second one of the piston and cylinder means with a clearance between the sealing means and the confronting surface sufficiently low to limit leakage to or from the respective port both axially and circumferentially of the piston when that port is fully confronted by the piston.

4,595,346

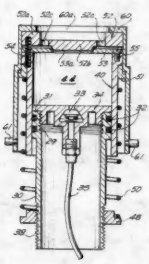
WATERLESS URINAL PUMPS

Edward Bozoyan, 1812 West St., Union City, N.J. 07087

Continuation of Ser. No. 395,264, Jul. 6, 1982, abandoned. This application Apr. 5, 1984, Ser. No. 597,410

Int. Cl.[4] F04B *7/00;* **E03D** *13/00, 11/00*

U.S. Cl. 417—513 **9 Claims**



1. A pouring liquid pumping device open to the outside atmosphere, connected to a discharge means, having an "at rest" position, an intake cycle and a compression cycle; the device being operable during the compression cycle for pumping the poured liquid; said device comprising:

pressure chamber means having a pressure chamber and a cover plate with a central opening open to the outside atmosphere during the "at rest" position;

actuating means for depressing the cover plate and the pressure chamber downwardly during the compression cycle, said actuating means also having a central intake opening for accepting poured liquid from the outside of the device;

a normally open inlet valve interposed between said pressure chamber and said actuating means and being also open to the outside atmosphere during the "at rest" position;

said normally open inlet valve having a rigid peripheral segment constantly urged under said actuating means;

said inlet valve further having a central valve head segment comprising a sealing face and an apertured segment connecting said peripheral segment and said valve head segment; and

said pressure chamber being adapted to be liquid filled from the exterior of the device by gravity, through the central opening of its cover plate, during the intake cycle and adapted to pump substantially all the pour-in liquid, through the discharge means, in one operative compression cycle.

4,595,347

ROTARY COMPRESSOR

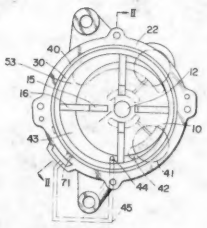
Hiroshi Sakamaki, Utsunomiya; Susumu Sugishita, Hanyu; Yukio Horikoshi, Kazo, and Kikuji Yanagihashi, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 616,813

Claims priority, application Japan, Jun. 9, 1983, 58-101713

Int. Cl.[4] F04C *18/348*

U.S. Cl. 418—173 **11 Claims**



1. A rotary compressor provided with a center housing, a rotary sleeve mounted for rotation in said center housing, a rotor eccentrically disposed in said rotary sleeve, said rotor being provided with a plurality of vanes movable therein, an air-bearing room disposed between the outer periphery of said rotary sleeve and the inner periphery of said center housing, a multiplicity of air-accumulating grooves formed in the outer periphery of said rotary sleeve and separated from one another, a discharge chamber, and at least one inlet formed on the compression side, inner periphery of said center housing and internally connected to the compression working space confined among said rotary sleeve, air-bearing room, said rotor and said adjacent vanes to supply air to said air-bearing room, said center housing being formed in the inner periphery of the rotary compressor with at least one pocket disposed at the upstream position of and peripherally aligned with said inlet, and said air-accumulating grooves having the suction portion thereof peripherally aligned with said inlet.

4,595,348

APPARATUS FOR SUPPORTING ROTARY SLEEVE OF ROTARY COMPRESSOR BY FLUID

Hiroshi Sakamaki, Utsunomiya; Yukio Horikoshi, Kazo, and Kikuji Yanagihashi, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00254, § 371 Date Jan. 11, 1985, § 102(e) Date Jan. 11, 1985, PCT Pub. No. WO84/04783, PCT Pub. Date Dec. 6, 1984

PCT Filed May 19, 1984, Ser. No. 691,482

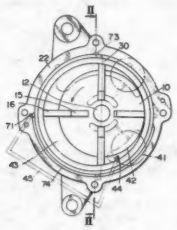
Claims priority, application Japan, May 20, 1983, 58-87733; May 20, 1983, 58-87734

Int. Cl.[4] F04C *18/348*

U.S. Cl. 418—173 **20 Claims**

1. Apparatus for supporting rotary sleeve of rotary compres-

sor by fluid, said apparatus comprising a center housing (22), a rotary sleeve (30) mounted in said center housing for rotation with a plurality of vanes (16) movably fitted in a rotor (10) which is eccentrically disposed in said rotary sleeve, an air-bearing room (40) defined between the outer periphery of said rotary sleeve and the inner periphery of said center housing,



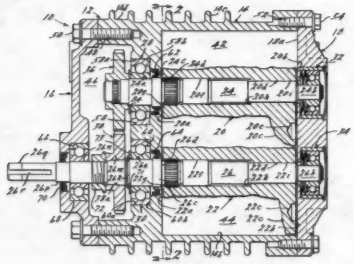
and an inlet port (71) provided in the inner periphery of said center housing and connected to a working space defined by said two adjacent vanes through an inlet passage (45), characterized in that said center housing (22) have the opposite end portions thereof formed with peripherally extending guide grooves (74).

4,595,349

SUPERCHARGER ROTOR, SHAFT, AND GEAR ARRANGEMENT

David M. Preston, Madison Heights, and Raymond A. Soeters, Jr., West Bloomfield Township, Pontiac County, both of Mich., assignors to Eaton Corp., Cleveland, Ohio

Filed Jun. 20, 1983, Ser. No. 506,073
Int. Cl.⁴ F01C *1/18*; B23P *11/00*
U.S. Cl. 418—206 **22 Claims**



1. In a rotary blower of the type including a pair of meshed, lobed rotors mounted for rotation within a housing, the improvement comprising:

a stepped bore extending through at least one of said rotors, said stepped bore defined by a plurality of axially spaced bore portions concentric to the rotational axis of the rotor and of different diameter; and

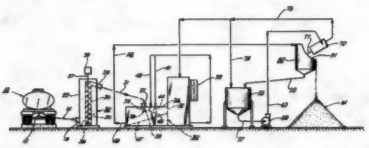
a shaft for supporting each of the rotors, at least one of said shafts being a stepped shaft defined by a plurality of axially spaced portions concentric to the rotational axis of the shaft and of sufficiently different diameter with respect to each other and with respect to said bore portions to form axially spaced apart pairs of interference fits with at least two of said bore portions when said shaft is pressed into said stepped bore, one of said plurality of shaft portions including a set of circumferentially spaced spline teeth formed of a material operative to deform the surface of one of said plurality of bore portions and thereby form mating splines in said one of said plurality of bore portions when said shaft is pressed into said step bore, said spline teeth being disposed axially adjacent one of said shaft portions forming one of said interference fits and being operative to form the mating spline teeth after at least partial engagement of said one interference fit for preventing axial misalignment of the shaft in the bore while the spline teeth form said mating splines.

4,595,350

PROCESS AND APPARATUS FOR PREPARING SULFUR HAVING UNIFORM PARTICLE SIZE DISTRIBUTION

Bruce Harbolt, Northridge, and James T. Saake, Los Angeles, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 14, 1985, Ser. No. 678,633
Int. Cl.⁴ B22D *11/01*; B22F *9/00*; B28B *1/54, 17/00*
U.S. Cl. 425—7 **7 Claims**



1. An apparatus for preparing a particulate sulfur, from molten sulfur, which comprises:

(a) means for elevating molten sulfur to a height sufficient to provide a head pressure,

(b) means for discharging said elevated molten sulfur downwardly as a coherent molten sheet of sulfur,

(c) means for directing a coherent water stream, at said molten sheet of sulfur, at a velocity rate and angle of flow sufficient to disrupt said molten sheet of sulfur and provide solid sulfur particles, having a substantially uniform size distribution,

(d) means for recovering said solid sulfur particles as an aqueous slurry thereof,

(e) means for separating said recovered aqueous slurry into sulfur particles wherein a substantial number of sulfur particles have a particle size of at least 20 mesh, and a mixture of sulfur fines and water, said sulfur fines having a particle size of less than 20 mesh,

(f) means for separating said mixture of sulfur fines and water into sulfur fines and substantially particle free water,

(g) means for recycling said separated substantially particle free water to said means for directing a coherent water stream (c), and

(h) means for recycling said sulfur fines the substantial absence of said substantially particle free water, back to said means for separating said aqueous slurry (e).

4,595,351

APPARATUS FOR APPLYING A DECORATIVE SEAL TO ENVELOPES AND THE LIKE

Richard A. Dickson, Goldvein, Va., and Allen H. Forrester, Cleburne, Tex., assignors to Omni Direct Mail Services, Ltd., Vienna, Va.

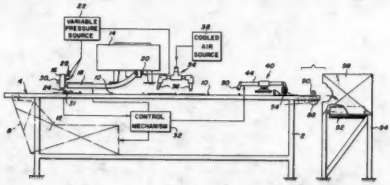
Filed Dec. 3, 1984, Ser. No. 677,474
Int. Cl.⁴ B29C *59/02*
U.S. Cl. 425—114 **8 Claims**

1. Apparatus for applying a decorative seal to envelopes and the like, comprising

(a) a frame;

(b) conveyor means mounted on said frame for successively transporting a plurality of envelopes along said frame in a generally horizontal linear direction;

(c) drive means connected with said conveyor means for intermittently driving said conveyor means;
(d) heated seal material supply means connected with said frame for storing heated seal material in a molten state;
(e) dispenser means connected with said supply means for depositing a given quantity of molten material at a given location onto an envelope;
(f) stamping means pivotally connected with said frame downstream from said dispenser means, said stamping means including an embossed die operable to stamp a decorative pattern into the molten material deposited on the envelope;
(g) cooling means connected with said embossed die, whereby during stamping of the molten seal material, the



stamped material is cooled to a temperature slightly below the solidification temperature thereof leaving a bead of molten material around the edge thereof; and
(h) control means connected with said drive means, said dispenser means, and said stamping means for controlling the intermittent drive of said conveyor means, the given quantity of molten material deposited on the envelope, and the actuation and release of said stamping means to emboss the deposited material, whereby the time interval between deposit of the molten material and stamping of the deposited material and the time interval of the stamping operation are controlled in accordance with the quantity, temperature, and type of seal material applied to the envelope.

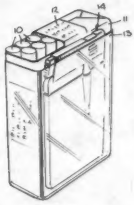
4,595,352

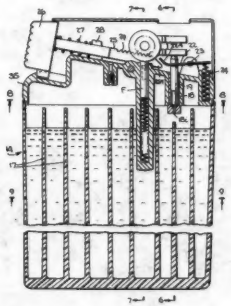
SINGLE-ACTION ULTRA-THIN CIGARETTE LIGHTER

Robert A. Endelson, New York, N.Y., assignor to Microtech Associates, New York, N.Y.

Continuation-in-part of Ser. No. 442,724, Nov. 18, 1982, Pat. No. 4,517,994. This application Jan. 16, 1985, Ser. No. 691,907
The portion of the term of this patent subsequent to May 2, 2002, has been disclaimed.
Int. Cl.[4] F23Q *2/16*
U.S. Cl. 431—254 **8 Claims**

1. A cigarette lighter in an ultra-thin card-like format for inse-tion between the corresponding front or rear rectangular faces of the inner and outer wrappers of a standard, crushable cigarette pack without significant distortion thereof, said lighter comprising:
(A) an open-top narrow reservoir filled with liquefied gas and having a width close to that of said rectangular faces and whose length is somewhat shorter than that of said rectangular faces, said reservoir having front and rear walls which are inclined to create a taper terminating at the bottom edge of the reservoir which is blade-shaped, making it possible to wedge the lighter between said faces; and
(B) a similarly narrow lighter assembly mounted on top of the reservoir to seal the liquefied gas therein, said assembly including a spark generator, a normally closed valve having an inlet extending into the reservoir to admit gas therefrom into a hollow stem having an outlet adjacent the spark generator, and manually-operated means to actuate the generator to produce a spark and to open the





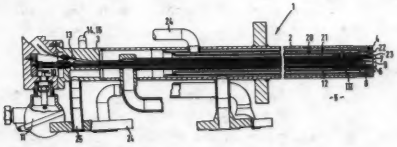
valve to emit gas from the outlet to be ignited by the spark.

4,595,353

BURNER WITH IGNITION DEVICE

Simon de Haan, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 19, 1985, Ser. No. 725,074
Claims priority, application United Kingdom, May 23, 1984, 8413160
Int. Cl.[4] F23Q *7/06*
U.S. Cl. 431—263 **6 Claims**



1. An ignition burner for use in start-up operations comprising:
a cylindrical housing;
a tubular element, having one end open for defining a flame port and disposed concentrically within said housing;
an annular front wall, said annular front wall extending from the cylindrical housing to the tubular element, said annular front wall in addition having an outlet means for oxygen-containing gas and fuel;
conduit means, said conduit means being disposed in the space between the housing and tubular element to separately supply fuel and oxygen-containing gas to said outlet means in the annular front wall;
an elongated electrode disposed concentrically in said tubu-

lar element and having an uninsulated end adjacent said flame port;

means communicating with the annular space between said electrode and tubular member for supplying a combustible gas mixture to said annular space;

a baffle assembly disposed in said annular space adjacent the uninsulated end of the electrode, said baffle assembly having a first passage means for supplying a low velocity flow of said combustible gas mixture to the uninsulated end of said electrode, and a second passage means for supplying a high velocity flow of said combustible gas mixture to the uninsulated end of the electrode; and

flame detector means disposed in said tubular member for detecting a flame present in said outlet means.

4,595,354

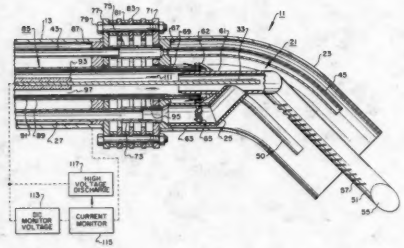
IGNITER FOR GAS DISCHARGE PIPE WITH A FLAME DETECTION SYSTEM

Romeo E. Guerra, 6118 Walnut Hill La., Dallas, Tex. 75234

Filed Jun. 11, 1985, Ser. No. 743,428

Int. Cl.[4] F23Q *3/00*

U.S. Cl. 431—264 **6 Claims**



1. In an igniter for a gas discharge pipe of a type having a tubular housing adapted to be mounted to the pipe, a fuel line extending into the housing for delivering gaseous fuel to a nozzle, the improvement comprising in combination:

an electrode adapted to be connected to a source of electrical energy and having a tip extending into the nozzle for creating a spark to ignite the fuel;

retaining means spaced from the nozzle for securing the electrode in the housing; and

gas circulation means for circulating hot gas from the nozzle around the electrode from the tip to the vicinity of the retaining means, to remove moisture from the space surrounding the electrode between the tip and the retaining means.

4,595,355

FORCED DRAFT BURNER

Peter A. Garrelfs, Etobicoke, and Walter H. Young, Scarborough, both of Canada, assignors to Pendell Boiler Limited, Toronto, Canada

Filed Jan. 29, 1985, Ser. No. 696,233

Int. Cl.[4] F23Q *3/00*

U.S. Cl. 431—265 **2 Claims**

1. A fuel burner comprising, in combination:

a housing having a rectangular base and a pair of opposed side walls;

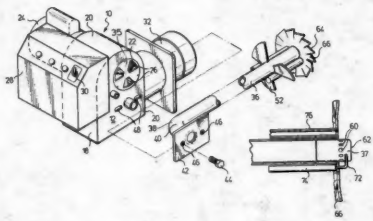
a cylindrical blast tube extending from said housing adapted to be connected to a source of forced-draft combustion air;

an inner tube substantially concentric with and spaced from said blast tube, defining an annular space therebetween, said inner tube extending from within the housing through the blast tube;

said pair of substantially concentric tubes having inlet and outlet ends, the inlet end of the inner tube having a substantially 90° bend whereby the inlet end of the inner tube abuts a housing side wall inner side, and the outlet end of the inner tube extending beyond the outlet end of the blast tube, said inner tube outlet end having a closed end with equispaced discharge outlets formed around the periphery of the inner tube extending beyond the blast tube forming a nozzle for discharging fuel radially outwardly from said inner tube;

means for removably connecting said inner tube inlet end to the housing side wall inner side, said housing side wall having an opening therein for communicating a source of fluid fuel to the inner tube;

vane means positioned within the annular space, said vane



means being fastened to said inner tube at a pre-selected point between the said inlet and outlet ends;

a circular spinner blade mounted at the outlet end of the blast tube, said spinner blade having a diameter smaller than the diameter of the blast tube to define a narrow annular slot adjacent the blast tube and said spinner blade having a plurality of vanes about its periphery, for the discharge of an annular flow of outer air with a swirling flow of inner air;

said inner tube being axially removable from the blast tube and housing without substantially changing the position of the vanes in relation to the inner tube; and

means to ignite said fuel.

4,595,356

BURNER CONSTRUCTION FOR AIR HEATERS USING AN ULTRASONIC ATOMIZER

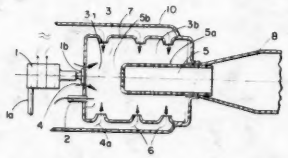
Gerhard Gaysert, Esslingen; Reinhard Gerwin, Stuttgart-Ost, and Dieter Götz, Kirchheim, all of Fed. Rep. of Germany, assignors to J. Eberspacher, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,177

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219065

Int. Cl.[4] F23D *15/02*

U.S. Cl. 431—352 **17 Claims**



1. A burner for air heaters, comprising first wall means defining an ignition chamber, an ultrasonic atomizer discharging fuel into said ignition chamber, primary air inlet means connected into said ignition chamber, second wall means defining a combustion chamber adjacent to said ignition chamber, ignition means in said ignition chamber for igniting fuel with primary air to form an igniting gas mixture, passage means for the passage of ignited gas mixture from said ignition chamber into said combustion chamber, secondary air inlet means connected into said combustion chamber to ignite secondary air with said ignited gas mixture for combustion within said com-

bustion chamber so as to produce high temperature gases, and a diffuser connected to said combustion chamber for the exhaust of the high temperature gases from said combustion chamber.

4,595,357

CONTINUOUS ANNEALING METHOD AND APPARATUS FOR COLD ROLLED STEEL STRIPS

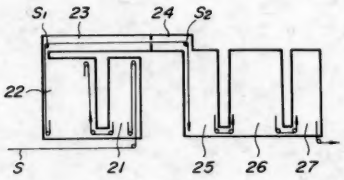
Kuniaki Sato; Yasuhisa Nakajima; Naohiko Soeda; Norio Ohta, and Atsushi Nagashima, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 3, 1985, Ser. No. 730,282

Claims priority, application Japan, May 4, 1984, 59-89930; May 4, 1984, 59-89931

Int. Cl.[4] F27B *9/28;* **C21D** *9/54*

U.S. Cl. 432—8 **16 Claims**



1. A method of continuously annealing cold rolled steel strips successively passing through a heating, a soaking and a cooling zone, which method comprises heating a steel strip in an upstream half of said heating zone while it passes about hearth rolls arranged one above the other therein, subjecting the steel strip to heating, soaking and cooling treatment in a high temperature zone of a downstream half of said heating, soaking and cooling zone without passing about hearth rolls, and thereafter cooling the steel strip in a downstream half of said cooling zone while it passes about hearth rolls arranged one above the other, thereby preventing heat buckling of the steel strip in the high temperature zone.

4,595,358

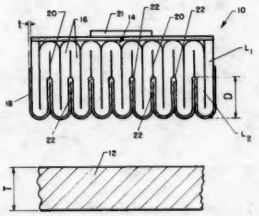
RE-RADIATING HEAT SHIELD

Vladimir B. Ginzburg, Pittsburgh, Pa., assignor to Wean United, Inc. and International Rolling Mill Consultant, Inc., both of Pittsburgh, Pa.

Filed Apr. 26, 1985, Ser. No. 727,959

Int. Cl.[4] F27D *7/00, 23/00;* **F28F** *13/00*

U.S. Cl. 432—65 **12 Claims**



10. A heat shield for re-radiating heat comprising:

thermal insulating material having a number of closely adjacent co-extending sections provided with one or more holding surfaces formed by said adjacent sections, and

thermal absorbing material having a fast heat up characteristic and having a portion directly exposable to a heat source which portion includes a series of relatively short co-extending surfaces,

said thermal absorbing material also including for each said short surface a substantially co-extending longer surface arranged not to be directly exposed to said heat source,

said longer surfaces of said thermal absorbing material arranged to enwrap at least a portion of a different one of said co-extending sections of said thermal insulating material and restrained by said holding surfaces of two adjacent sections of said insulating material,

wherein the nature and thermal mass of said thermal absorbing material and the nature and relationship of said thermal insulating material relative thereto greatly increases the re-radiating thermal characteristics of said thermal absorbing material.

4,595,359

APPARATUS FOR TREATING WORKPIECES IN A COMBUSTION CHAMBER

Hans-Jürgen Conrad, Rutesheim; Wolfgang Mauz, Leinfelden-Echterdingen, and Walter Schildhorn, Fellbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

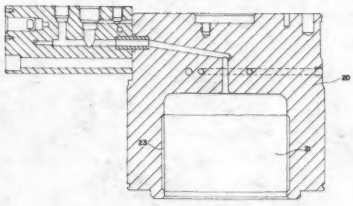
PCT No. PCT/DE83/00219, § 371 Date Jul. 23, 1984, § 102(e) Date Jul. 23, 1984, PCT Pub. No. WO84/04266, PCT Pub. Date Nov. 8, 1984

PCT Filed Dec. 24, 1983, Ser. No. 638,475

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314397

Int. Cl.[4] F27B *5/04;* **C21B** *7/04;* **F27D** *1/00*

U.S. Cl. 432—205 **12 Claims**



1. Apparatus for treating workpiece by means of pressure and temperature pulses by ignition of a gaseous mixture, particulary thermal deburring apparatus having means defining a work chamber;

a closing plate means for closing the chamber,

the chamber being adapted to receive the workpieces,

supply duct means passing through the top part of the work chamber opposite the closing plate and discharging into the work chamber; and

means for mixing and igniting a mixture of combustion gas and oxygen in the chamber,

characterized by

a lining (**21**; **26**, **27**; **34**; **43**; **51**, **55**) of high temperature resistant ceramic material on at least some of the walls of the chamber exposed to the mixture of combustion gas and oxygen upon ignition thereof.

4,595,360

FIXTURE FOR USE DURING MANUFACTURE OF WING STRUCTURE

LeNoir E. Zaiser, 1825 8th St., South, Naples, Fla. 33440

Filed Nov. 13, 1984, Ser. No. 670,645

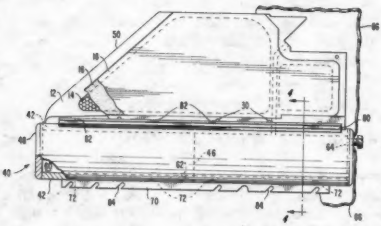
Int. Cl.[4] F27D *5/00*

U.S. Cl. 432—253 **17 Claims**

1. A fixture for holding a wing structure during steps of its manufacture, the root of said wing structure including a pair of opposed, elongated base flanges forming a generally C-shaped base, an elongated slot extending generally parallel to and centrally located between said-base flanges, and conduits for

fluid communication between said root and remote areas of said wing structure, said fixture comprising:

(a) an elongated, rigid member including an elongated surface portion curved at a predetermined radius and means for inducing a distortion in said wing structure sufficient to compensate for thermally induced dimensional changes in said wing structure after removal from said fixture;



(b) elongated key means radially extending from said curved surface portion for cooperating with said slot to rigidly align said wing structure with the longitudinal axis of said member; and

(c) means on opposite sides of said key means for removably securing said base flanges to said curved surface portion.

4,595,361

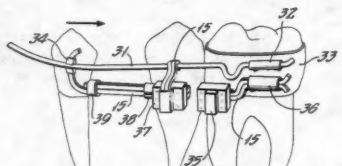
MAGNETIC FORCE ORTHODONTIC KIT AND APPLIANCES CONSTRUCTED THEREFROM

Abraham Blechman, Tappan, N.Y., and Eugene A. Pescatore, Elmwood Park, N.J., assignors to Medical Magnetics, Inc., Ramsey, N.J.

Filed Jan. 22, 1985, Ser. No. 693,268

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—18 **22 Claims**



1. A universal kit for construction of magnetic force orthodontic appliances comprising in combination a plurality of modules each comprising a body of permanently magnetized material and means defining at least two orthogonally related through passages of non-circular cross-section, and a supply of attachment wire having a cross-section that permits threading said wire through either of said passages while precluding rotation of said module about said wire.

4,595,362

HANDLE

Denis Ackermann, Worben, Switzerland, assignor to David Mosimann, Switzerland

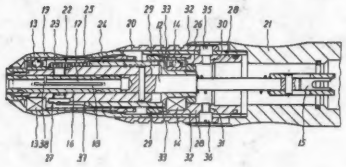
PCT No. PCT/CH84/00072, § 371 Date Jan. 11, 1985, § 102(e) Date Jan. 11, 1985, PCT Pub. No. WO84/04447, PCT Pub. Date Nov. 22, 1984

PCT Filed May 11, 1984, Ser. No. 697,588

Claims priority, application Switzerland, May 11, 1983, 2590/83

Int. Cl.[4] A61C *1/14*

U.S. Cl. 433—129 **6 Claims**



1. A handle comprising: a rotor shaft (**12**) mounted on at least two antifriction bearing means (**13, 14**), with a rear end of the shaft (**12**) being provided with a connection for a transmission (**15**), and an opposite end of the shaft comprising a cylindrical socket ((**16**); a cylindrical sleeve (**17**) fitted in the socket and having at least one longitudinal slot (**18**) penetrating the sleeve, the sleeve (**17**) being adapted to receive a cylindrical shank (**11**) of a tool; a tripartite body forming a shell for the rotor shaft, with a first part thereof comprising an at least partly cylindrical nosepiece (**19**) in which the rotor shaft is suspended through the antifriction bearing means (**13, 14**), a second part comprising a grooved ring (**20**) embracing with sliding friction a cylindrical portion of the nosepiece (**19**), and a third part comprising a rear member (**21**) which is secured to a rear portion of the nosepiece (**19**); at least one screw means (**22**) having a circumferentially toothed upper portion (**23**) forming a pinion and having a threaded portion seated in the rotor shaft (**12**) and extending perpendicularly to the shaft, the screw means being rotatable to locally compress the sleeve (**17**); a hollow cylindrical spindle (**24**) at least partly surrounding the rotor shaft (**12**) and extending between the shaft and an inner race of a rear one of the bearing means (**14**) to which the spindle is joined in a manner so as to follow rotary motion of the rotor shaft (**12**) yet remain axially independent of the shaft, the spindle having a front end with a rack (**25**) engaged with the pinion (**23**) for rotation of the screw means (**22**) with axial motion of the spindle with respect to the shaft, to compress and release the sleeve (**17**).

4,595,363

DENTAL HANDPIECE HAVING MEANS FOR OPENING AND CLOSING A CHUCK

Takasuke Nakanishi, Kanuma, Japan, assignor to Nakanishi Dental Mfg. Co., Ltd., Kanuma, Japan

Filed Aug. 2, 1984, Ser. No. 637,009

Claims priority, application Japan, Aug. 2, 1983, 58-120876[U]

The portion of the term of this patent subsequent to Jan. 15, 2001, has been disclaimed.

Int. Cl.[4] A61C *1/14*

U.S. Cl. 433—129 **4 Claims**

1. A dental handpiece having means for opening and closing a chuck, comprising:

a handle portion;

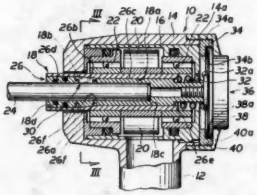
a powerhead assembly supported on said handle portion;

a hollow driving shaft having a plurality of radial turbine blades around the periphery thereof and journalled only for rotation in said handle portion, said driving shaft having, adjacent a forward end, a large diameter front hollow

portion and a small diameter rear hollow portion and a forwardly outwardly tapering hollow portion joining said front and rear portions;

a hollow cylindrical chuck axially slidably positioned in said hollow driving shaft, said cylindrical chuck having a large diameter front peripheral surface and a small diameter rear peripheral surface and a forwardly outwardly tapering outer peripheral surface joining said front and rear peripheral surfaces, said surfaces corresponding to said large diameter front hollow portion, said small diameter rear hollow portion and said forwardly outwardly tapering hollow portion, respectively, said cylindrical chuck having a plurality of radial slots opening through said forwardly outwardly tapering surface at equally spaced positions therearound;

a flat plate-shaped chucking die slidably positioned in each



said radial slots and having when viewed in cross-section, a round radially outer surface, and a pair of shoulders and a concave surface therebetween at the radially inner surface, said inner surface projecting slightly into the interior of said cylindrical chuck;

a helical compression spring around said cylindrical chuck and having one end engaged with a rear portion of said cylindrical chuck and the other end engaged with a rearwardly facing surface of said driving shaft for urging said cylindrical chuck rearward; and

a chuck pusher in said powerhead assembly at the rear end of said cylindrical chuck and normally disengaged from said cylindrical chuck and movable into said powerhead assembly for engagement with said cylindrical chuck for sliding said cylindrical chuck within said driving shaft against the force of said helical spring to release said chucking dies.

4,595,364

DENTAL PROSTHESIS AND PROCESS FOR PREPARING THE SAME

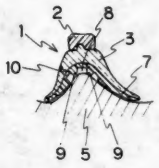
Takae Kusano, and Masato Ueno, both of Hiroshima, Japan, assignors to Molten Corp. and Kabushiki Kaisha Four Brain, both of Hiroshima, Japan

Filed Feb. 12, 1985, Ser. No. 701,006

Claims priority, application Japan, Feb. 15, 1984, 59-27866; Jun. 15, 1984, 59-124230; Jun. 15, 1984, 59-124231

Int. Cl.[4] A61C *13/24*

U.S. Cl. 433—185 **6 Claims**



1. A dental prosthesis having artificial teeth, a denture base of hard polymer material holding said artificial teeth and an elastic lining layer substantially covering the inner surface of said denture base, comprising:

(a) a recess portion of the same material as the material of said elastic lining layer on said elastic lining layer for forming a sealed chamber defined by said elastic lining layer and the mucosa of the alveolus ridge of the wearer of said dental prosthesis;

(b) a small bore for communicating said sealed chamber with the exterior of said dental prosthesis through said elastic lining layer and said denture base;

(c) a check valve of a soft elastic material in said small bore near the exit end of said small bore for exhausting air in said chamber from said recess portion to said exterior, said check valve having a triangle section projection from said exit end in the direction toward the interior of said base; and

(d) a member for preventing the alveloar gingiva of said wearer of said dental prosthesis from projecting into said recess portion due to a deformation of said wearer's alveolar gingiva, said preventing member including a number of projections of the same material as that of said elastic lining layer, said projections being located within said recess portion, each projection having a height no greater than the distance between the bottom of said recess portion and said mucosa of the alveolus ridge of said wearer.

4,595,365

METHOD OF AND APPARATUS FOR CLEANING TEETH

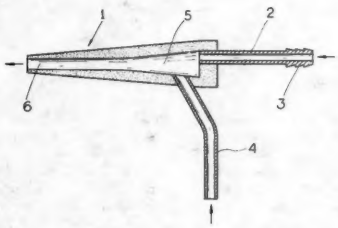
Alan Edel; Julian Edel, and Edgar Asher, all of 19 Keren Kayemet St., Petach, Tikva, Israel

Filed Nov. 16, 1984, Ser. No. 672,487

Claims priority, application Israel, Nov. 21, 1983, 70281

Int. Cl.[4] A61C *3/02*

U.S. Cl. 433—216 **5 Claims**



1. A method for cleaning and polishing teeth employing a water soluble abrasive powder material comprising:

a. homogeneously mixing in a dental hand piece an abrasive laden gas stream and a liquid stream in which said abrasive is soluble without full dissolution of said abrasive;

b. directing said homogeneous mixture from said dental hand piece as a single stream; and

c. directing said single stream against the surface of a tooth to be cleaned.

4,595,366

WINDSURF SIMULATOR

Pierre Berger, La Mole, 83310 Cogolin, France

Filed Jan. 17, 1984, Ser. No. 572,651

Claims priority, application France, Jan. 18, 1983, 83 00670

Int. Cl.[4] G09B *9/06*

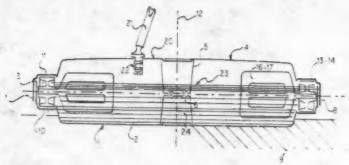
U.S. Cl. 434—60 **17 Claims**

1. A windsurf simulator comprising:

(a) A pedestal;

(b) A platform rotatably mounted on the pedestal, said platform comprising means for receiving a sail mast;

(c) support means interposed between said platform and said pedestal, said support means comprising a plurality of rollers interposed between said pedestal and said platform,



said rollers being adapted to roll as said platform rotates on said pedestal and said rollers comprising damping means for damping the rotation of said platform relative to said pedestal.

4,595,367

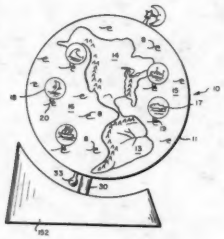
INSTRUCTIONAL GLOBE

Maria K. Forsyth, 63 Sterling Pl., West Boylston, Mass. 01583

Filed Aug. 20, 1984, Ser. No. 642,649

Int. Cl.[4] G09B *27/08*

U.S. Cl. 434—147 **16 Claims**



1. An instructional globe comprising a globe-shaped body defining a spherical surface, a plurality of appendages and medallions, each appendage and medallion bearing the representation of a geographical feature, said medallions comprising a head, neck and base, means for removably attaching the appendages and medallions to the globe-shaped body at pre-established positions, said means for removably attaching the medallions comprising an opening in the surface of the globe-shaped body bounded by a concave depression, the surface of which has a radius of curvature greater than the head of the medallion part such that when the medallion is attached to the globe by engagement of the base with the opening, the medallion is free to oscillate in response to rotation of the globe body and said means for removably attaching the appendages comprising a plurality of cues formed in the globe-shaped body, each cue having a correspondence in shape to at least one of said appendages, whereby the placement of each of said appengages in its respective pre-established position is faciliated.

4,595,368

INSTRUCTIONAL APPARATUS FOR UNDERWATER WELDING

Edgar C. Cole, 724 B St., Taft, Calif. 93268

Filed Jul. 29, 1985, Ser. No. 759,871

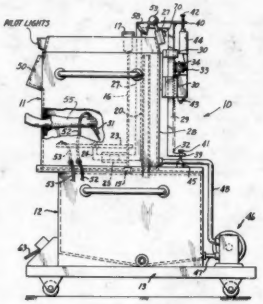
Int. Cl.[4] G09B *19/24;* G23K *9/00*

U.S. Cl. 434—234 **9 Claims**

1. Apparatus for use by a trainee to make underwater electric welds comprising:

an open water tank having a welding station and a workpiece bench;

electrically powered reversible means exteriorly of said tank and electrically insulated from said workpiece bench for adjusting said workpiece bench to support a workpiece at a desired submerged height and including foot operated control means therefor;



the sidewall of said tank having a pair of rubber gloves with the inlets thereof opening through and sealed to said sidewall; and

an electric welding stinger within said tank connectible by an insulated power lead to a source of welding power.

4,595,369

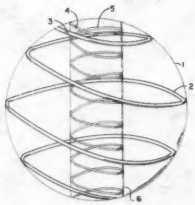
EDUCATIONAL AND AMUSEMENT DEVICE

Arthur R. Downs, 1509 Hodges Ferry Rd., Portsmouth, Va. 23701

Filed Mar. 8, 1985, Ser. No. 709,892

Int. Cl.[4] G09B *23/08*

U.S. Cl. 434—302 **1 Claim**



1. An amusement device comprising:

a hollow transparent sphere;

a first length of transparent tubing;

a second length of transparent tubing;

a transparent cylinder;

said transparent cylinder being disposed within said transparent sphere, the axis of said transparent cylinder passing through the center of said transparent sphere, and each end of said transparent cylinder being attached to the inside surface of said transparent sphere;

the ends of said first length of transparent tubing being attached to the two ends, respectively, of said transparent cylinder;

said first length of transparent tubing being configured in a cylindrical helix, the axis of said cylindrical helix being coincidental with said axis of said transparent cylinder; an intermediate section of said first length of transparent tubing being attached to said transparent cylinder at an intermediate point along the length of said transparent cylinder;

the ends of said second length of transparent tubing being attached to the inside surface of said hollow transparent

sphere adjacent to the two ends, respectively, of said transparent cylinder;

said second length of transparent tubing being configured in a spherical helix, the axis of said spherical helix being coincidental with said axis of said transparent cylinder; an intermediate section of said second length of transparent tubing being attached to the inside surface of said hollow transparent sphere;

a first moveable member disposed within said first length of transparent tubing; said first moveable member having a convex periphery and having a maximum cross-sectional dimension less than the inside diameter of said second length of transparent tubing; and

a second moveable member disposed within said second length of transparent tubing; said second moveable member having a convex periphery and having a maximum cross-sectional demension less than the inside diameter of said second length of transparent tubing.

4,595,370

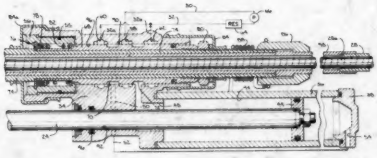
INTEGRAL VALVE AND CYLINDER ASSEMBLY FOR POWER STEERED MARINE DRIVE

Mark Small, Boca Raton, Fla., assignor to Brunswick Corp., Skokie, Ill.

Continuation of Ser. No. 567,256, Dec. 30, 1983, abandoned. This application Aug. 27, 1985, Ser. No. 770,705

Int. Cl.[4] B63H *25/30*

U.S. Cl. 440—53 **11 Claims**



8. An integral hydraulic valve and cylinder assembly for power steering a marine drive, comprising;

a valve body having a spool-receiving bore and a rodreceiving bore therein, said bores define longitudinal axes disposed parallel to and laterally spaced from one another, said spool-receiving bore communicating with a fluid inlet port, a pair of fluid outlet ports and a pair of work passages in said body, and said rod-receiving bore opening into a piston-receiving chamber disposed coaxially with said rod-receiving bore with one of said work passages in communication with one end of said chamber and the other of said work passages in communication with the other end of said chamber;

a hollow valve spool axially slidable within said spool-receiving bore between neutral and operational positions for selectively establishing fluid communication of the inlet port with the outlet ports and work passages, said spool defines a longitudinal opening therethrough for receiving a steering cable having a cable jacket and core movable relative to one another, said core extendable through said longitudinal opening for connection between a steering means and a steering arm of a marine drive;

connection means for connecting said valve spool with the cable jacket for movement therewith; and

a rod axially slidable within said rod-receiving bore for assisting in moving said marine drive to alter the course of a boat, one end of said rod connectable to said marine drive and the other end of said rod connected to a piston slidable within said piston-receiving chamber.

4,595,371

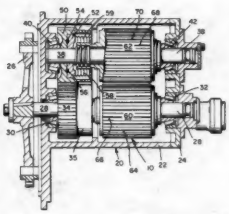
POWER TAKE-OFF SYSTEM FOR MARINE ENGINES

Scott Heston 1233-79th St., South, St. Petersburg, Fla. 33707

Filed Dec. 30, 1983, Ser. No. 567,168

Int. Cl.[4] F16D *21/04*

U.S. Cl. 440—75 **14 Claims**



1. A hydraulically actuated power take-off system for marine engines comprising:

a. an input shaft connected to the flywheel of an engine through coupling means;

b. bearing means supporting said input shaft so as to permit rotational movement of the input shaft;

c. a first gear attached on said input shaft;

d. a first hydraulic clutch pack assembly attached to said first gear;

e. an idler shaft running in the same horizontal plane as and substantially parallel to and spaced apart from said input shaft;

f. bearing means supporting said idler shaft so as to permit rotational movement of the idler shaft;

g. a second gear attached on said idler shaft and configured to intermesh with said first gear;

h. a second hydraulic clutch pack assembly attached to said second gear;

i. a first chain drive sprocket assembly located on said input shaft and spaced apart from said first gear and first hydraulic clutch pack assembly;

j. said first hydraulic clutch pack assembly being engagable with said first chain drive assembly so that power may be transferred from said first gear and said first hydraulic clutch pack assembly to said first chain drive assembly;

k. said first chain drive sprocket assembly including a drum which is mounted on said input shaft by bearings and containing sprockets on the outer surface of the drum;

l. a second chain drive sprocket assembly located on said idler shaft and spaced apart from said second gear and second hydraulic clutch pack assembly;

m. said second hydraulic clutch pack assembly being engagable with said second chain drive assembly so that power may be transferred from said second gear and said second hydraulic clutch pack assembly to said second chain drive assembly;

n. said second chain drive sprocket assembly including a drum which is mounted on said idler shaft by bearings and containing sprockets on the outer surface of the drum;

o. an output shaft located below said input shaft and said idler shaft;

p. bearing means supporting said output shaft so as to permit rotational movement of the output shaft;

q. a third chain drive sprocket assembly located on said output shaft;

r. said third chain drive sprocket assembly including a drum which is mounted on said output shaft and containing sprockets on the outer surface of the drum;

s. said first chain drive sprocket assembly, said second chain drive sprocket assembly, and said third chain drive sprocket assembly substantially in alignment so that the three drum surfaces containing sprockets are aligned;

t. the sprockets on the three drum surfaces of the three sprocket assemblies being connected by a band chain;

u. a housing member encasing all of the above elements of the power take-off system; and

v. the rear end of said output shaft protruding through the rear of said casing and connected to an outdrive assembly which includes a driveshaft and a propeller.

4,595,372

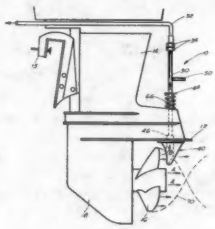
WATER EJECTOR AND INJECTOR ATTACHMENT FOR BOATS

Gary Hebert, Rte. #1, Box 245, Jeanerette, La. 70544

Filed Jun. 3, 1985, Ser. No. 740,495

Int. Cl.[4] B63H *21/10*

U.S. Cl. 440—88 **11 Claims**



1. A water ejector and injector attachment for the motor of a boat comprising:

a. a motor adapted to be secured to the frame of said boat having a propeller at the lower end thereof and defining:

i. a cavitation plate extending rearwardly thereof and having:

A. a bore therethrough; and

B. at least one recess in the lower surface thereof; a

ii. a trim tab projecting downwardly from said cavitation plate and positioned adjacent and rearward of said propeller, said trim tab and having:

A. a passageway therethrough having one end communicating with said bore of said cavitation plate; and

B. a plate member integral therewith and having at least on protrusion upwardly extending therefrom, each of said at least one protrusion selectively mating in said at least one recess in said lower surface of said cavitation plate thereby securing said trim tab to said cavitation plate;

b. an elongated tubular member for providing a passageway for fluid provided through said bore in said cavitation plate and having one end secured to said trim tab and communicating with said passageway of said trim tab and its other end terminating in said boat; and

c. means for biasing said trim tab upwardly thereby engaging said at least one protrusion within said at least one recess.

4,595,373

PADDLE HOLDER

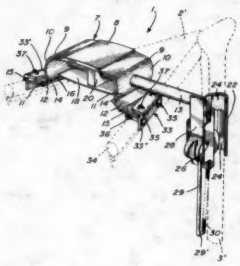
Piérre Giroux, 1515 Papineau Street, Trois-Rivières, Quebec, Canada (G8Z 4H7)

Filed Nov. 13, 1984, Ser. No. 671,118

Int. Cl.[4] B63H *16/06*

U.S. Cl. 440—104 **9 Claims**

1. A paddle holder for use with a conventional canoe, comprising a support bracket adapted to be attached to one end of said canoe, said support bracket having the general form of a bridge long enough to span transversely of said end of said canoe and including a top portion; a pair of side walls merging with said top portion; each said side wall in turn merging at its lower edge with an outwardly-projecting flange; each said flange being adapted to rest on and be secured to said end of said canoe; a rigid, transverse horizontal shaft having one end portion journalled in said side walls for rotation in said support bracket and having its opposite end portion projecting outwardly away from one side of said canoe when said support bracket is attached to said end of said canoe; a paddle handle clamp means rigidly secured to said opposite end portion of said horizontal shaft and adapted to securely, releasably grip



the handle of a canoe paddle, and resilient shaft indexing means, whereby said canoe paddle is yieldably held in an operative position with its blade being submerged and will rotatably yield and come back to its operative position if said blade encounters a submerged obstacle.

4,595,374

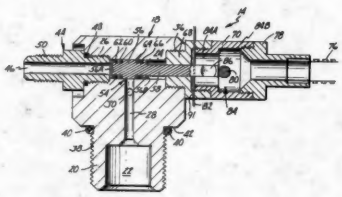
RAFT INFLATION VALVE

Lloyd G. Wass, 1670 Blackhawk Cove, Eagan, Minn. 55123

Filed Apr. 13, 1983, Ser. No. 484,454

Int. Cl.[3] B64D *17/00*

U.S. Cl. 441—35 **23 Claims**



1. A normally closed valve which is actuated to permit flow of a pressurized inflation gas from a pressure vessel, the valve comprising:

a valve body having an inlet for connection to the pressure vessel, an outlet, an internal cylinder connected at a first end to the outlet, and an inlet passage which extends from the inlet and intersects the internal cylinder at a position intermediate the first end and a second end of the internal cylinder;

a double-ended piston positioned for axial movement in the internal cylinder, the piston having a piston head with first and second ends of equal diameter, a piston rod which is connected at a first end to the piston head and which has a second end extending out of the second end of the cylinder, and first and second spaced apart O-ring seals carried by the first and second ends of the piston head and positioned on opposite sides of the intersection of the internal cylinder and the inlet passage when the valve is in its normally closed condition; and

valve actuating means for applying a pulling force directly to the second end of the piston rod in the axial direction away from the outlet to cause the piston head to move toward the second end of the internal cylinder to uncover the intersection of the internal cylinder and the inlet passage and permit gas flow from the inlet to the outlet; wherein the valve actuating means comprises a pull cable having a ball attached at one end for engaging a detent in

the piston rod, so that pulling force on the cable is transmitted through the ball to the piston rod as a pulling force in the axial direction; and ball retaining guide means for maintaining the ball and the detent in force transmitting relationship as the ball pulls the piston rod until the intersection of the internal cylinder and the inlet passage is at least partially uncovered, and then permitting the ball to disengage the detent so that the pull cable is disconnected from the valve; and

piston retaining means positioned at the second end of the internal cylinder for limiting axial movement of the piston head so that the piston head remains in the internal cylinder after actuation of the valve, the piston retaining means having an axial passage through which the piston rod extends.

4,595,375

IMAGING AND STREAKING TUBES, AND METHODS FOR FABRICATING THE IMAGING AND STREAKING TUBES

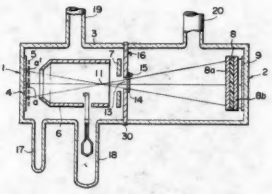
Katsuyuki Kinoshita, and Yoshiji Suzuki, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 15, 1983, Ser. No. 551,835

Claims priority, application Japan, Nov. 24, 1982, 57-205769; Sep. 6, 1983, 58-163940

Int. Cl.[4] H01J *9/233*

U.S. Cl. 445—14 **4 Claims**



1. A method of fabricating an imaging tube whose microchannel-plate is used to multiply the photoelectrons emitted from the photoelectric layer and to observe the diminished light image comprising:

assembling process to separate first space including at least one surface to form a photoelectric layer formed within an envelope exhausted to obtain a vacuum and a focusing electrode, from second space including at least a microchannel-plate and a phosphor layer on the separation wall with an opening arranged on the tube axis so that said opening may be arranged at or near the crossover point of photoelectrons, and also to provide a lid which is being closed on said opening during fabrication;

exhausting process to exhaust said first and second spaces;

photoelectric layer forming process to form a photoelectric layer while introducing alkali metal to form said photoelectric layer via a branching tube into said first space;

ejection process to cut said branching tube, to exhaust said envelope while said envelope is being heated, and to eject photoelectric layer forming materials which do not contribute to form said photoelectric layer; and

removing process to remove said lid from said opening after completion of exhausting operations.

4,595,376

MAGAZINE CONTAINING RETENTION PINS FOR THE TREATMENT OF BROKEN AND UNDERMINED TEETH

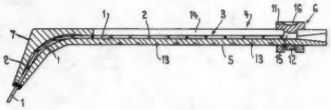
Harald E. Nordin, Villa Amphion, CH-1822 Chernex, Switzerland

Filed May 24, 1985, Ser. No. 737,661

Claims priority, application European Pat. Off., May 25, 1984, 84810256.2

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—225 **6 Claims**



1. A magazine for housing a plurality of retention pins for the treatment of broken or undermined teeth, said retention pins being arranged in the form of a bar and separated by pre-determined break points between successive retention pins, said magazine having means for advancing said bar and a handle, said handle having said bar advancing means fixed thereto and a head fixed thereto at an obtuse angle, said head including a means for retaining said retention pins.

4,595,377

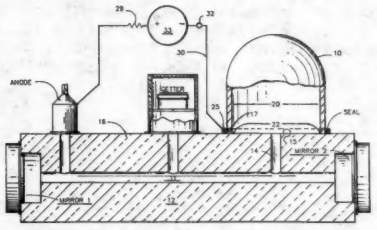
COLD CATHODE FABRICATION FOR RING LASER GYROSCOPE

Gordon S. Norvell, Huntington Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 10, 1984, Ser. No. 679,711

Int. Cl.[4] H01S *3/097*; H01J *9/02*

U.S. Cl. 445—28 **9 Claims**



1. A method for making an improved cold electrode for electron emission and for engagement with a laser housing, said laser housing being formed from a homogeneous material having a coefficient of expansion of less than 10×10^{-8} cm per cm/°C., and having a resonant cavity containing an ionized gain medium, said ionized gain medium being vented to a surface location on said laser housing surface, said improved cold electrode being formed by the method of:

using a non-metallic machinable homogenous material characterized by a resistivity in the range 30×10^{-4} to 80×10^{-4} ohm-cm and a thermal coefficient of expansion of less than 2.5×10^{-6} cm per cm/°C., to form an electrode body having at least one cavity and an aperture,

forming an electrode support surface as a perimeter around said body aperture, said electrode support surface being complementary to said laser housing surface for complementary engagement with said laser housing surface,

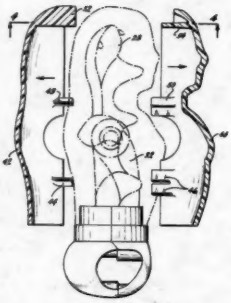
sealing said electrode support surface to said housing surface, said laser housing support surface being positioned to contain said housing vent, and

coupling an electrical contact to said electrode body to pass current therethrough.

4,595,378
TOY ACTION FIGURE

Roger H. Sweet, Long Beach, and Edward Mayer, Los Angeles, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 27, 1985, Ser. No. 781,300
Int. Cl.[4] A63H *3/16*
U.S. Cl. 446—99 3 Claims

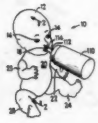


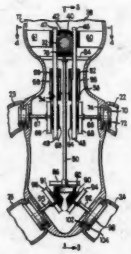
1. A toy action figure comprising an inner core depicting a first character and a removable outer shell covering the inner core and depicting a second character, said inner core including a figure having an upper torso, a head and two arms, said first character having two snake body formations extending from the torso to define the arms thereof.

4,595,379
BOTTLE DRIVEN ARTICULATED DOLL

Russell G. Rasmussen, Skokie, Ill.; Steven P. Hanson, Richfield, Minn., and Jeffrey D. Breslow, Highland Park, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 14, 1985, Ser. No. 691,130
Int. Cl.[4] A63H *3/40*
U.S. Cl. 446—341 16 Claims



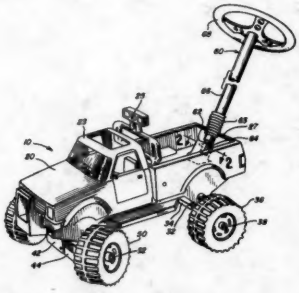


1. An articulated doll comprising:
a hollow head and torso;
the head including an open mouth;
arms and legs mounted for rotational movement relative to the torso;
an external drive member having a gear fitting into the mouth of the doll;
drive means for effecting the back and forth pivoting movement of the arms and legs relative to the torso;
gear means carried within the hollow head and torso for transmitting rotational movement of the drive member to the arm and leg drive means to pivot the arms and legs back and forth relative to the head and torso;
the gear means including a drive tube carried within the hollow head for rotational movement both clockwise and counterclockwise about the axis of the tube;
the tube having a first coaxial gear engageable through the mouth by the external drive member;
additional coaxial gear means attached for rotation with the tube being engageable with the arm and leg drive means;
the arm and leg drive means includes separate drive means for the left arm and separate drive means for the right arm;
the drive tube is mounted for limited movement transverse to the axis of the drive tube as well as for rotational movement about the axis; and
the additional coaxial gear means is, by movement of the drive tube transverse to the axis, selectively engagable with either the left arm drive means or right arm drive means.

4,595,380
STEERABLE WHEELED TOY

Ronald G. Magers, One Elm St., Manchester, Mass. 01944

Filed Jan. 31, 1984, Ser. No. 575,519
Int. Cl.[4] A63H *33/02, 17/00, 17/36*
U.S. Cl. 446—451 13 Claims



1. A walk behind toy comprising a miniature truck body; a rear axle secured in a fixed position to the rear of said body, said rear axle having axially spaced rear wheels operatively attached thereto for independent rotation; spaced front wheels each generally forward of one of said rear wheels; a bracket secured in a fixed position toward the front end of said truck body and substantially parallel to said rear axle; a supporting mechanism for mounting each of said front wheels including a supporting arm pivotally secured to each end of said bracket and a stub shaft secured to said supporting arm and having one of said front wheels operatively attached thereto for independent rotation; a tie rod pivotally secured between said supporting arms so that said front wheels are maintained in parallel relationship; and a steering column mounted toward the rear of said truck body with a steering wheel affixed to the distal end thereof and flexible torque transmitting means comprising a cylindrical bellow between said column and said body so that rotating said steering wheel imparts torsional force to said body around a vertical axis near said rear axle which correspondingly urges the front of said body to the left or right causing said front wheels to point in the direction of desired movement.

4,595,381
TOY VEHICLE WITH ELECTRIC MOTOR

Camille Dibold, Bischoffsheim, and Frederic Rubach, Ostwald, both of France, assignors to Joustra S.A., Illkirch Graffenstaden, France

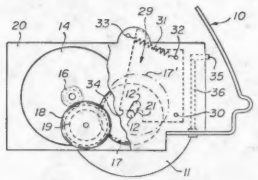
PCT No. PCT/FR83/00011, § 371 Date Sep. 6, 1983, § 102(e) Date Sep. 6, 1983, PCT Pub. No. WO83/02400, PCT Pub. Date Jul. 21, 1983

PCT Filed Jan. 18, 1983, Ser. No. 541,345

Claims priority, application France, Jan. 19, 1982, 82 00863; Jan. 10, 1983, 83 00369

Int. Cl.[4] A63H *29/24*

U.S. Cl. 446—463 **9 Claims**



1. A toy vehicle having wheels with a drive axle and comprising:

(a) an electric motor, an electrical energy source therefor and electrical contact means for energizing and deenergizing the electric motor,

(b) a drive mechanism associated with said drive axle and with said electric motor, add

(c) guide means associated with said drive axle and said drive mechanism so as to provide relative movement between a first position for drivingly connecting the drive axle to the drive mechanism and a second position for disconnecting the drive axle from the drive mechanism, said toy vehicle comprising the improvements consisting of

(d) said electric motor (**13**) is operatively assocaited with an inertial mass (**14**) so that when pivoting motor is energized it drives this inertial mass to thereby impart kinetic energy thereto for subsequent delivery of said energy from the inertial mass to said drive axle (**12**), and

(e) said drive axle (**12**), said drive mechanism (**15–19**), said guide means (**21**) and said electrical contact means (**22**) are operatively associated in such a manner that, in said first position, said electric motor (**13**) is deenergized while said drive axle (**12**) is drivingly connected to said inertial mass (**14**) via said drive mechanism (**15–19**) and, in said second position, said electric motor (**13**) is energized while said drive axle (**12**) is disconnected from the drive mechanism (**15–19**), whereby the energized electrical motor drives said inertial mass (**14**) when said drive axle (**12**) is disconnected from the drive mechanism (**15–19**), the said improvements being arranged so that in said first position the toy vehicle can be propelled so as to provide acceleration thereof by means of kinetic energy accumulated in said inertial mass each time after its has been driven by said electric motor in said second position.

4,595,382
POWER TRANSMISSION MECHANISM WITH TORQUE CONVERTER

Masahiro Ohkubo, Kadoma, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

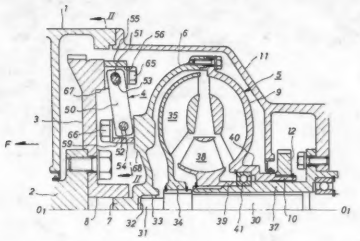
Filed Nov. 19, 1984, Ser. No. 672,627

Claims priority, application Japan, Dec. 27, 1983, 58-248534

Int. Cl.[4] F16D *3/06, 3/50*

U.S. Cl. 464—82 **6 Claims**

1. A power transmission mechanism with torque converter having an input side flywheel an output side torque converter disposed concentrically with the flywheel, with a front cover of the torque converter being coupled with the flywheel, wherein at least one leaf spring being approximately parallel to the center line in the widthwise direction is radially placed between the front cover and flywheel in order to couple the front cover and flywheel elastically in the circumferential direction, and the leaf spring and at least one of the front cover



and flywheel possess a play which may allow the front cover and flywheel to move relatively in the radial direction and in the direction of center line.

4,595,383
TELESCOPIC SHAFT ASSEMBLY

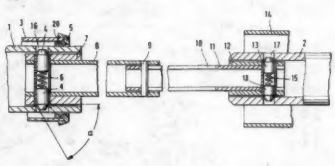
Clemens Nienhaus, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,763

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334709

Int. Cl.[4] F16C *3/03;* A01B *71/00;* B60K *17/28*

U.S. Cl. 464—162 **4 Claims**



1. A telescopic shaft assembly particularly for transmitting torque between the power takeoff shaft of a tractor and an agricultural implement, comprising:

first and second profiled shafts configured to provide telescopic engagement with each other including means for transmitting torque between said profiled shafts when said profiled shafts are telescopically engaged;

a pair of longitudinally extending tubular tie anchors telescopically insertable one within the other;

a first and a second releasable engaging device each connecting one of said tubular tie anchors with one of said profiled shafts, respectively;

each of said engaging devices comprising spring means applying a spring force holding said engaging devices and said profiled shafts, respectively, in engaged position and permitting disengagement thereof against the force of said spring means, said spring means operating to allow the inner one of said tubular tie anchors to be disengaged from its respective profiled shaft with a smaller disengaging force than the outer of said tie anchors; and

connecting means telescopically joining said pair of tubular tie anchors together, said connecting means comprising a pair of axially extending slots formed on one of said tie anchors closed at both ends and a catch bolt affixed to the other of said tie anchors extending into said slots and movable axially therein;

said connecting means operating to join said tie anchors nonrotatively relative to each other while permitting telescopic length adjusting relative movement therebetween;

said spring means comprising a first spring member for the one of said engaging devices connecting the inner one of

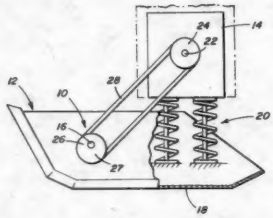
said tubular tie anchors with its respective profiled shaft and a second spring member for the other of said engaging devices connecting the outer of said tubular tie anchors with the other profiled shaft, said first spring member being formed to exert an engaging spring force which is smaller than the spring force of said second spring member.

4,595,384

MECHANISM FOR MAINTAINING CONSTANT BELT TENSION ON SHEAVES WITH A NON-FIXED CENTER DISTANCE

Christian T. Tertinek, 3301 Cheshire Rd., Canandaigua, N.Y. 14424

Filed Jun. 1, 1984, Ser. No. 616,164
Int. Cl.[4] F16H 7/10
U.S. Cl. 474—112 **7 Claims**



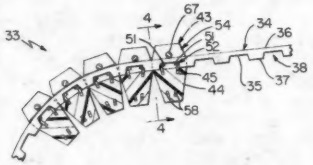
1. A mechanism for maintaining substantially constant belt tension on sheaves having a non-fixed center distance during rotation comprising a drive sheave and a driven sheave drivingly interconnected by a belt, said driven sheave being connected to an off-center weighted shaft supported by a vibratory member in which relative movement between the centers of the sheaves enables excessive belt tension variation, said mechanism comprising the mounting of the driven sheave eccentrically to the shaft with the eccentric portion of the driven sheave being offset in the same direction as the off-center weight on the shaft to maintain the center-to-center distance between the center of the sheaves more constant thereby maintaining belt tension more constant.

4,595,385

BELT CONSTRUCTION, TRANSVERSE BELT ELEMENT THEREFOR AND METHOD OF MAKING THE SAME

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Mar. 26, 1984, Ser. No. 592,773
Int. Cl.[4] F16G 1/00, 1/21
U.S. Cl. 474—201 **51 Claims**



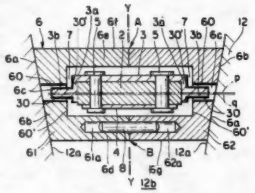
1. In an endless power transmission belt construction comprising an endless carrier means having an inner surface means and an outer surface means, and a plurality of transverse belt elements assembled on said carrier means, each said belt element comprising a block of polymeric material having a reinforcing member of metallic material disposed therein, each said reinforcing member comprising a folded blank defining two spaced apart side parts that extend outboard of one of said surface means of said carrier means and an elbow means joining said side parts together and extending outboard of the other of said surface means of said carrier means, each said belt element having a slot means receiving said carrier means therein and a shoulder means that defines part of said slot means and engages said inner surface means of said carrier means, the improvement wherein said side parts of each said reinforcing member of each said belt element define said shoulder means of their respective belt element.

4,595,386

V-BELT ASSEMBLY FOR TRANSMITTING POWER

Susumu Okawa, Numazu; Yasunobu Jufuku, and Shigeru Okuwaki, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 22, 1985, Ser. No. 693,150
Claims priority, application Japan, Jan. 25, 1984, 59-10304; Jan. 25, 1984, 59-10305; Jan. 25, 1984, 59-10306; Jan. 25, 1984, 59-10308
Int. Cl.[4] F16G 5/16, 1/22
U.S. Cl. 474—201 **19 Claims**



1. A V-belt assembly trained over V-belt wheels for transmitting power, comprising:

a flexible endless belt;

a plurality of rigid suspension members fixedly secured to the endless belt perpendicularly to a longitudinal direction of the endless belt; and

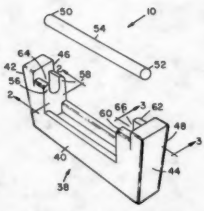
a plurality of generally rectangular rigid transmission pieces surrounding the respective suspension members in a section perpendicular to said longitudinal direction of the endless belt and supported pivotably by pivotal projections projecting sideways from opposite sides of the suspension member while being capable of engaging V-shaped grooves in the V-belt wheels, wherein each of said transmission pieces is formed of first and second generally U-shaped pieces.

4,595,387

V-BELT

John P. Frazier; Donald R. McComber, both of Littleton, and Gerhard D. Nichols, Sedalia, all of Colo., assignors to The Gates Rubber Company, Colo.

Filed Oct. 19, 1984, Ser. No. 662,863
Int. Cl.[4] F16G 5/16, 5/18, 7/00
U.S. Cl. 474—201 **7 Claims**



1. In a power transmission belt of the type having a plurality of V-blocks attached to a generally flat band type load carrying member, the blocks each having a reinforcement that encircles and supports the load-carrying member, wherein improvement in the reinforcement comprises:

a generally U-shaped member having a lower beam member integrally interconnecting end portions of two spaced

apart, diverging diagonal side members that each have a cantilevered portion with a means for retaining an upper beam member, the retaining means comprising deformable sides that define a slot that is longitudinally oriented with the lower beam member; and

an upper beam member that is substantially parallel to the lower beam member and having two end portions which individually fit in one of the slots, the deformable sides of the slots crimped against and retaining the end portions of the upper beam member whereby the beam member transversely supports diverging diagonal side members.

7. A reinforcement element for a V-belt comprising:

a generally U-shaped member integrally interconnecting end portions of two spaced apart, diverging diagonal side members that each have a cantilevered portion with a means for retaining an upper beam member, the retaining means comprising deformable sides that define a slot that is longitudinally oriented with the lower beam member; and

an upper beam member that is substantially parallel to the lower beam member and having two end portions which individually fit in one of the slots, the deformable sides of the slots crimpable against the end portion for retaining the upper beam member.

4,595,388

DRIVING BELT

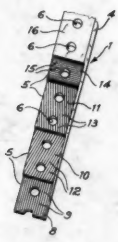
Giorgio Tangorra, Monza, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Apr. 17, 1984, Ser. No. 601,280

Claims priority, application Italy, Apr. 18, 1983, 20656 A/83

Int. Cl.[4] F16G *1/26*

U.S. Cl. 474—204 **12 Claims**



1. A flat belt for transmitting motion between two pulleys comprising an annular body of elastomeric material, said belt being characterized in comprising a flat-shaped annular body, reinforced with continuous flexible elongated elements resistant to traction, directed in the longitudinal direction of the belt and embedded in the elastomeric material, at least a plurality of openings obtained in said annular body aligned in the longitudinal direction of the belt to engage with corresponding protuberances on the pulleys, said openings engaging partially a length of said belt from side to side, said annular body being provided with reinforcing elements directed in parallel with respect to one another in a first direction inclined with respect to the longitudinal direction of the belt and further reinforcing elements directed in parallel to one another in a second direction inclined with respect to the longitudinal direction of the belt in a substantially symmetrical way with respect to the first direction, said elements directed in said first direction and said elements directed in said second direction constituting an indeformable reinforcing structure closely arranged around said openings, said elements directed in said first direction and said elements directed in a second direction transmitting stresses from said openings to said continuous elements directed in said longitudinal direction of said belt.

4,595,389

STACK OF DETACHABLY-CONNECTED BAGS WITH PUNCH-OUT HANDLE-GRIP OPENINGS AND PROCESS FOR MAKING SAME

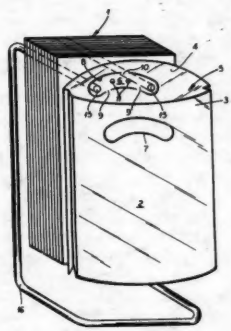
Hans Lehmacher, Niederkassel-Mondorf, Fed. Rep. of Germany, assignor to Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel-Mondorf, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,958

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1984, 3420620

Int. Cl.[4] B21B *1/14*; B65D *33/10*; B65H *3/58*; B32B *31/00*

U.S. Cl. 493—227 **14 Claims**



7. In a process for making a stack of bags each having bag walls and an upper bag opening, each of said bag walls of said bags being provided with a centrally positioned punch-out piece whose removal results in a handle grip positioned adjacent said upper bag opening, wherein said punch-out piece of each of said bags in the ones of said bag walls that are on one and the same side of all of said bags in said stack are removed, and said punch-out pieces not removed from said bags are left in said stack and are interlocked with each other, the improvement comprising making an oblong perforation defining said punch-out pieces which result in said handle grips in said bag walls, and connecting said bags with each other by interlocking said punch-out pieces remaining in said stack of said bags.

4,595,390

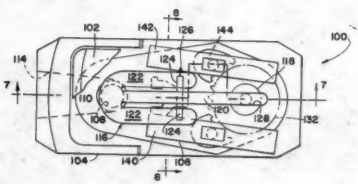
MAGNETICALLY-ADJUSTABLE CEREBROSPINAL FLUID SHUNT VALVE

Salomon Hakim, Carrera 13, N., 48-26, Bogota, Colombia, and Carlos A. Hakim, 3400 Galt Ocean Dr., Apt. 1702 South, Fort Lauderdale, Fla. 33308

Continuation-in-part of Ser. No. 516,137, Jul. 21, 1983, abandoned. This application Dec. 8, 1983, Ser. No. 559,864

Int. Cl.[4] A61B *5/00*

U.S. Cl. 604—9 **33 Claims**



1. A surgically-implantable shunt valve for venting cerebrospinal fluid in the treatment of hydrocephalus and for shunting other body fluids, said valve comprising

a housing constructed of a surgically-implantable material,

an inlet and outlet chamber within said housing,

said housing including inlet and outlet ports communicating with said inlet and outlet chambers respectively for connecting said inlet and outlet chambers to external catheters or other fluid conduits,

an aperture communicating between said chambers, said aperture having a circular periphery forming a circular valve seat,

a valve element of diameter larger than said circular valve seat,

spring means for biasing said valve element against the circular valve seat so as to keep said aperture closed until the cerebrospinal fluid pressure in said inlet chamber exceeds a preselected popping pressure and so as to open said aperture when said popping pressure is exceeded so as to vent cerebrospinal fluid through said aperture into said outlet chamber, and

incremental magnetic adjustment means for increasing or decreasing the amount of said bias in finite increments in response to pulses of a magnetic field applied from outside the body ao as thereby to increase or decrease said popping pressure in finite increments, said incremental magnetic adjustment means comprising

a primary member adapted to cooperate with said spring means so as to increase or decrease said bias when said primary member is moved, said primary member not being itself susceptible to movement by said external magnetic field, and

a secondary member susceptible to said applied magnetic field and mounted and positioned with respect to said primary member so as to be capable of movement relative to said primary member and so as to cause no more than an incremetal movement of said primary member for each pulse of said magnetic field.

4,595,391

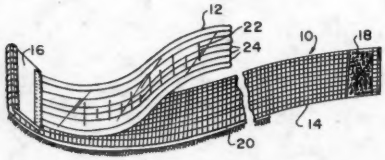
OINTMENT APPLICATOR

George Abplanalp, 1037 Rosedale Rd., Venice, Fla. 33595

Filed Jan. 10, 1984, Ser. No. 569,726

Int. Cl.[4] A61F *7/02*

U.S. Cl. 604—308 **12 Claims**



1. A medication ointment applicator for applying a predetermined amount of medication ointment tc a person's skin, said applicator comprising a band of flat plastic pliable film, a band of elastic material of a greater length than said band of plastic film, said band of plastic film having an end attached proximate an end of said band of elastic material, a scale longitudinally disposed substantially along the centerline of the band of plastic film provided with length graduations for measuring a length of ribbon of medication ointment applied to a surface of said plastic film for engagement with a person's skin, and fastening means at the other end of said band of elastic material for attaching said other end to a portion of said band of elastic material whereby said applicator is wound around a person's limb with said plastic film carrying said ointment in engagement with the skin of said person.

4,595,392

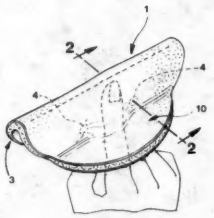
INTERLABIAL PAD

Russell L. Johnson, Waupaca County, and Frederich O. Lassen, Winnebago County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 3, 1983, Ser. No. 538,702

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 A **8 Claims**



1. A method for making an interlabial pad comprising:

(a) providing a pad blank having a labia facing surface, a bottom surface, side edges, arcuate leading and following edges, and a center line extending between said leading and following edges, said pad blank including an absorbent layer, and a fluid permeable cover overlying the labia facing surface of said absorbent layer,

(b) folding said pad blank along said center line into oppositely disposed halves with said fluid permeable cover facing outward, a folded edge thereby being defined along said center line, and

(c) fixing said halves together at two fixation points which are each spaced from both said folded edge and said side edges so as to form a raised, hollow, cylindroidal, centrally disposed portion designed to engage the labia of the wearer, said portion extending generally along and adjacent said folded edge, and a pair of lateral flaps extending away from the raised cylindroidal portion, wherein the leading and following edges of said raised portion are arcuately shaped, said two fixation points being sufficiently spaced from each other to provide a finger receiv-

ing channel between said flaps and extending into said raised portion for use in inserting said pad.

4,595,393

HIP JOINT PROSTHESIS HAVING A HOLLOW SHAFT

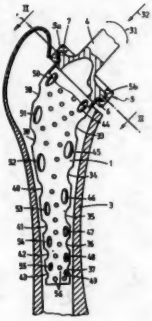
Emmanuel Anapliotis, and Curt Kranz, both of Berlin, Fed. Rep. of Germany, assignors to Mecron Medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,641

Int. Cl.[4] A61F 1/04

U.S. Cl. 623—22 **14 Claims**

1. A hip joint assembly comprising: an elongated shaft; a neck portion; a ball joint connected to one end of said neck portion; and a detachable mounting ring coupling said shaft to said neck portion; said shaft being a hollow shell constructed to be inserted and secured in an intramedullary canal of a femur; said shaft having, at a proximal end thereof; a projection extending outwardly therefrom; said shell having locally weakened means formed therein and dimensioned and positioned for adapting the response of said shaft to mechanical loading stresses of said femur; and said neck portion having an elongated stem at said one end thereof for connection to said ball joint and having, at the opposite end of said neck portion, a base protection extending outwardly therefrom, said base projection being configured to be coupled with said projection of said shaft, and said base projection being secured to said



projection of said shaft by said detachable mounting ring, with said detachable mounting ring encircling said projections.

4,595,394

AGENT FOR IMPROVING PROCESSABILITY OF CELLULOSE FIBERS: ACID POLYMER SALTS FOR IMPROVED SCOURING

Masakatsu Okamoto; Shigeru Nagao, and Kazuhisa Yagi, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 595,792

Claims priority, application Japan, Apr. 8, 1983, 58-61952; Apr. 11, 1983, 58-63466; May 12, 1983, 58-83426; May 12, 1983, 58-83427; May 23, 1983, 58-90371; May 23, 1983, 58-90372; Jan. 6, 1984, 59-573; Jan. 6, 1984, 59-574; Jan. 6, 1984, 59-575; Jan. 19, 1984, 59-7859; Jan. 19, 1984, 59-7860; Jan. 19, 1984, 59-7861; Jan. 26, 1984, 59-12710

Int. Cl.[4] D06P *5/22;* **C11D** *7/54;* **D06L** *3/02*

U.S. Cl. 8—139 **7 Claims**

1. In a method which comprises scouring cellulose fibers containing water-repellent substances, comprising greases, waxes or oils, to remove said water-repellent substances so that the penetration of chemicals is facilitated, and then subjecting the scoured fibers to bleaching, dyeing and finishing steps, the improvement which comprises: p1 in said scouring step, contacting said fibers, under scouring conditions, with an aqueous scouring solution containing an alkali, a surfactant effective for removing impurities from said fibers and, as a scouring property improving agent, for 0.01 to 20 grams, per liter of said scouring solution, of a water-soluble alkali metal, ammonium or alkanolamine salt of a polymer selected from the group consisting of polyacrylic acid, polymethacrylic acid, polymaleic acid, copolymer of maleic acid and acrylic acid, and copolymer of maleic acid and methacrylic acid, said salt having an average molecular weight of from 200 to 10,000.

4,595,395

LUBRICATING AND ADDITIVE MIXTURES FOR ALCOHOL FUELS AND THEIR METHOD OF PREPARATION

Earl J. Smith, 2310 Cherry Ridge La., Brandon, Fla. 33511

Continuation of Ser. No. 375,762, May 6, 1982, abandoned. This application Oct. 29, 1984, Ser. No. 665,094

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 **28 Claims**

1. A lubricating additive for alcohol fuels, said additive consisting essentially of about 94–96%, by volume, organic solvent selected from the class consisting of mineral spirits, toluene, xylene, benzene, naphtha, cyclohexane, hexane, heptane, pentane, isopentane, and mixtures thereof; about 0.2–1.5%, by volume, emulsifier; at least about 3–4%, by volume, lubricant; and about 0.3–0.5, by volume, ethylene-vinyl acetate copolymer, wherein said additive is mixed with an alcohol fuel at about 4–6%, by volume, of the fuel-additive mixture.

4,595,396

COMPOSITION COMPRISING 1,3,5-TRIOXANE

J. Gordon Erdman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 14, 1984, Ser. No. 610,227

Int. Cl.[4] C10L *1/14*

U.S. Cl. 44—63 **15 Claims**

1. A composition of matter comprising 1,3,5-trioxane at least partially dissolved in a solvent, said solvent comprising at least one alcohol, which makes up at least about 50 weight percent of said solvent, and at least one further ingredient selected from the group consisting of water, an aldehyde and a ketone in a minor amount effective to depress the crystallization temperature of said trioxane in said solvent.

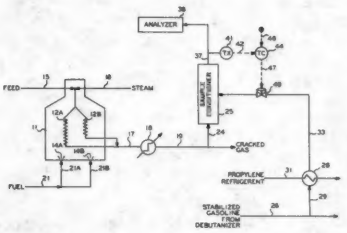
4,595,397

SAMPLE CONDITIONING

Philip V. Steed, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 22, 1982, Ser. No. 421,225

Int. Cl.[4] B01D *47/00*



U.S. Cl. 55—37 **14 Claims**

8. A method for conditioning a sample of the gaseous mixture from a cracking furnace, wherein said gaseous mixture contains the products produced by the cracking of a hydrocarbon-containing feed stream supplied to said cracking furnace, said method comprising the steps of:

contacting a portion of said gaseous mixture with a suitable hydrocarbon containing absorbent stream, wherein some of the heavy components in said gaseous mixture are absorbed by said absorbent stream;

removing a conditioned stream containing the lighter components in said gaseous mixture as a conditioned sample;

removing stabilized gasoline as a bottoms product from a debutanizer column; and

passing said stabilized gasoline in contact with a refrigerant to produce said absorbent stream.

4,595,398

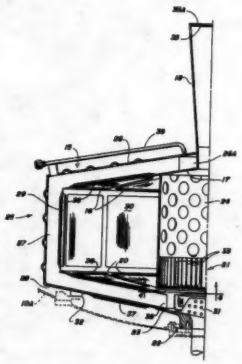
PROPELLANT ACQUISITION DEVICE

George F. Orton, St. Louis County, Mo., and Thomas F. Schweickert, Madison County, Ill., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 21, 1984, Ser. No. 612,085

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—182 **11 Claims**



1. A propellant supply container having an outlet to which is connected a propellant acquisition device adapted for supplying a maneuvering thrust engine of a space vehicle with propellant from the supply container, said acquisition device being located in the container in the region of the outlet but not eleswhere and comprising:

(a) a propellant trap device mounted in the container adja-

cent the outlet and having liquid permeable surfaces enclosing an internal space separate from the supply container, with the surfaces being capable of passing the liquid propellant and retaining the liquid propellant in the internal space, all for collecting the propellant in the internal space, the permeable surfaces including a first end surface at one end of the internal space, a second end surface spaced from the first end surface and being at the other end of the internal space, and a peripheral surface extended generally between the end surfaces and generally around the internal space;

(b) a liquid propellant outlet opening located outwardly from the internal space at the second end surface of said trap device and connected to the supply container outlet;

(c) propellant vapor escape means opening from the internal space at the first end surface of said trap device and into the supply container in a direction away from said outlet opening; and

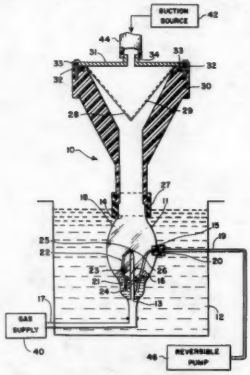
(d) liquid propellant flow channels extending about said internal space of said trap device at spaced intervals, with each channel having a portion along the first end surface, another portion along the peripheral surface and still another along the second end surface, the three portions for each channel being in communication with each other and further being in communication with such internal space through a liquid permeable surface that is likewise capable of passing the liquid propellant, said portions of the flow channels that are located along the second end surface having ends opening toward and into said outlet opening for directing liquid propellant substantially directly into said outlet opening.

4,595,399

NEBULIZATION REFLUX CONCENTRATOR

Vernon G. Collins, Poquoson, and Wesley R. Cofer, III, Grafton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 5, 1984, Ser. No. 668,432
Int. Cl.[4] B01D *47/02*
U.S. Cl. 55—255 **2 Claims**



1. Apparatus for removing trace constituents from a gas comprising, in combination:

a nebulizing vessel having an inlet and an exit,

a reservoir of gas absorbing liquid solvent contained within said nebulizing vessel,

an atomizing nozzle positioned inside said vessel in fluid communication with said vessel inlet and terminating above the level of said reservoir of gas absorbing liquid,

a tubular gas inlet leading from a gas supply and disposed in sealed fluid communication with said vessel inlet and said atomizing nozzle,

an open ended siphon tube attached parallel to said atomizing nozzle and having a first open end thereof disposed within said reservoir of liquid solvent and a second reduced diameter open tip end disposed adjacent the tip of said atomizing nozzle,

a filter housing sealingly connected at one end thereof to said nebulizing vessel exit and in operative spaced relationship to said exit to preclude passage of gas except through said filter,

a liquid solvent-phobic filter disposed within said filter housing, said filter being positioned so as to be in the path of any gas exiting from said vessel and serving to trap any liquid solvent coming in contact therewith while permitting gas flow to exit therethrough,

an end closure for said filter housing and having an exit port therein permitting gas passing through said filter to exit from said apparatus,

a top plate circumferentially sealed to and closing the end of said filter housing opposite to the end thereof connected to said nebulizing vessel,

said top plate having an exit therethrough for removal of the gas filtered by said liquid solvent-phobic filter,

a conical wire mesh screen disposed within said filter housing operatively spaced across said nebulizing vessel exit,

said conical wire mesh screen serving as support structure for said liquid solvent-phobic filter with said filter mounted on the internal side of said screen forcing all egressing gas through said filter, whereby

gas received from the gas supply travels through said tubular gas inlet to said atomizing nozzle and upon exit from said nozzle siphons liquid solvent from said reservoir to entrain the gas into a mist with the liquid soluble trace constituents in the gas flow going into solution, and the trace constituent free gas passing through said filter as the liquid droplets from the mist coalesce onto said filter and fall back into said reservoir.

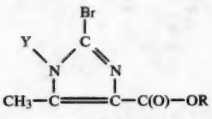
4,595,400

HERBICIDAL ESTERS OF 2-BROMO-4-METHYLIMIDAZOLE-5-CARBOXYLIC ACID

Andrea Leone-Bay, Ridgefield, Conn.; Edward D. Weil, Hastings-on-Hudson, and John Tomko, Dobbs Ferry, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 18, 1984, Ser. No. 662,009
Int. Cl.[4] A01N *43/50;* C07D *233/90*
U.S. Cl. 71—92 **13 Claims**

4. The method of controlling undesirable vegetation comprising applying to the area where control is desired an herbicidally effective amount of a compound having the structural formula



wherein R is C_1–C_{10} alkyl; Y is C_3–C_8 cycloalkylalkyl wherein the alkyl has 1 to 6 atoms; C_1–C_6 alkyl or C_3–C_6 alkenyl.

4,595,401

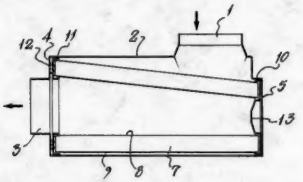
AIR FILTERS

Stanley P. Witchell, 17 Town Close, Vicarage Hill, Dartmouth, South Devon, England

Continuation of Ser. No. 129,529, Mar. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 558,496, Mar. 14, 1975, abandoned. This application Aug. 10, 1981, Ser. No. 291,859
Int. Cl.[4] B01D *50/00;* B60J *13/02*
U.S. Cl. 55—385 B **7 Claims**

1. An air cleaner of the kind employing a pleated paper filter element in the form of a frustum of a cone mounted in a tubular casing having a first opening axially thereof communicating with the inside of said element at the relatively wide end of said

frustum and a second opening in the cylindrical wall of said casing communicating with the outside of said element in the vicinity of the relatively narrow end thereof, the axis of said element being positioned so that it is tilted relative to the axis of the casing away from said second opening in the direction



from said first opening to said second opening, whereby the radial clearance between the filter element and said second opening is increased for a given filter element without increasing the size of the casing.

4,595,402

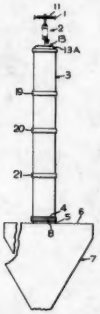
SUSPENSION SYSTEM FOR MOUNTING FILTER BAGS IN A BAGHOUSE

John L. Silletto, and Francis E. Dahlem, both of Louisville, Ky., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 645,678, Aug. 30, 1984, abandoned. This application May 16, 1985, Ser. No. 735,043

Int. Cl.[4] B01D *46/02*

U.S. Cl. 55—378 **6 Claims**



1. A suspension system for use in mounting filter bags in a baghouse of the type including; a gas tight housing, a floor plate having apertures therein, mounted in said housing to divide said housing into a dirty gas chamber having a dirty gas inlet and a clean gas chamber having a clean gas outlet to permit a flow of gas through said housing, a plurality of said filter bags mounted in said clean gas chamber with each filter bag having a closed end and an open end, said open end of each bag secured in gas tight relation around one of said apertures, and a filter bag cleaning means of the type which causes the filter bags to periodically contract a limited amount in overall length during a cleaning cycle; wherein the improvement in said suspension system comprises a pretensioned resilient member presenting first and second ends, said first end connected to said closed end of said filter bag and said second end connected to said baghouse housing to place said filter bag in tension, said resilient member having an amount of pretension which is, (1) high enough to prevent displacement thereof and cause the filter bag to remain taut when subjected to a first loading force exerted by the combined weight of said filter bag and a predetermined maximum dust load in said filter bag during normal dust filtering operation, but (2) low enough to permit momentary displacement of said resilient member when subjected to a second loading force which is the sum of said first loading force and an additional loading force imposed by said contraction of said filter bag during said cleaning cycle.

4,595,403

HEAT EXCHANGE ELEMENT

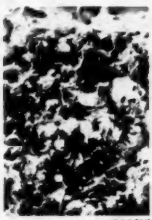
Yoshiharu Sago, Nagoya; Masaji Kurosawa, Chiba, and Nobutaka Kanamori, Tokyo, all of Japan, assignors to Toho Gas Co. Ltd., Nagoya; Nichias Corporation and Honshuseishi Kabushiki Kaisha, both of Tokyo, all of, Japan

Filed Aug. 29, 1984, Ser. No. 645,354

Claims priority, application Japan, Sep. 2, 1983, 58-160299

Int. Cl.[4] B01D *39/20*

U.S. Cl. 55—389 **3 Claims**



(3000X)

1. A heat exchange element comprising a molded product from paper-like material made of ceramic fibers as a matrix, wherein interstices among the ceramic fibers are uniformly filled with 100–170 g/m^2 of molecular sieve particulates having an average particle diameter of 5.5μ or less, the ceramic fibers and the molecular sieve particulates being bound by a silicic acid gel derived from collodial silica or ethyl silicate.

4,595,404

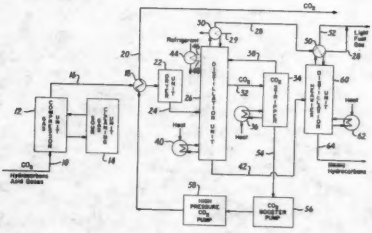
CO_2 METHANE SEPARATION BY LOW TEMPERATURE DISTILLATION

Brain J. Ozero, 225 E. 36 St., Apt. 19A, New York, N.Y. 10016; Michael P. Czaikowski, Stafford, and H. Edward Gimpel, Houston, both of Tex., assignors to Brian J. Ozero, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,298

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—18 **18 Claims**



1. A process comprising, regenerating a CO_2 gaseous feed stream further containing a significant acid gas component having a CO_2 concentration of about 60–90 mole %, as well as a variety of carbonaceous compounds, including,

compressing and cooling the CO_2 feed stream to a suitable elevated temperature and superatmospheric pressure;

substantially removing any acid gases present from the CO_2 feed stream;

drying the CO_2 feed stream;

separating the CO_2 feed stream in a single distillation zone, which is primarily externally refrigerated, into:

(a) a light fuel gas stream having a CO_2 concentration sufficiently high to proclude freezing in said distillation zone,

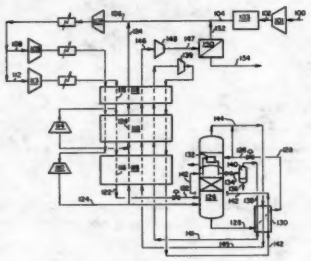
(b) a liquid, substantially CO_2-containing stream of a purity sufficient for use in tertiary oil recovery, and
(c) a heavy hydrocarbon stream;
cooling the light fuel gas stream;
pressurizing and transporting the substantially CO_2-containing liquid stream into a suitable heat exchange zone;
heating the CO_2-containing liquid stream to a suitable temperature to form a suitable product stream;
separating the heavy hydrocarbon stream into a lighter fuel gas stream and a heavier substantially CO_2-free hydrocarbon stream.

4,595,405

PROCESS FOR THE GENERATION OF GASEOUS AND/OR LIQUID NITROGEN

Rakesh Agrawal, Allentown, and Steven R. Auvil, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 21, 1984, Ser. No. 684,655
Int. Cl.[4] F25J 3/04
U.S. Cl. 62—18 **18 Claims**



1. A process for the production of gaseous and/or liquid nitrogen from a feed gas stream comprising nitrogen and oxygen, said process comprising providing an additional degree of freedom for adjusting the process parameters by:
(a) feeding said feed gas stream comprising nitrogen and oxygen to a cryogenic separation unit to treat said gas stream;
(b) withdrawing at least a portion of the treated gas stream from the cryogenic separation unit;
(c) feeding said portion of the treated gas stream to a membrane unit wherein said stream is separated to form a nitrogen-rich stream and an oxygen-rich stream;
(d) returning said nitrogen-rich stream to the cryogenic separation unit for further treatment and separation; and
(e) subsequently recovering a purified liquid and/or gaseous nitrogen-rich product stream.

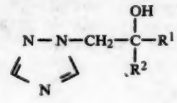
4,595,406

PLANT GROWTH REGULATION USING TRIAZOLE ETHANOLS

Keith P. Parry; Paul A. Worthington, both of Maidenhead, and William G. Rathmell, Wokingham, all of England, assignors to Imperial Chemical Industries PLC, Hertfordshire, England

Division of Ser. No. 183,410, Sep. 3, 1980, Pat. No. 4,551,469, which is a continuation-in-part of Ser. No. 124,253, Feb. 25, 1980. This application Feb. 10, 1984, Ser. No. 579,012
Claims priority, application United Kingdom, Mar. 7, 1979, 7908003; Sep. 21, 1979, 7932819; Feb. 15, 1980, 8005141; Aug. 18, 1980, 8026884
Int. Cl.[4] A01N 43/653, 43/84
U.S. Cl. 71—076 **5 Claims**

1. A method of regulating plant growth which comprises applying to the plant or plant locus a plant growth regulating amount of a compound of the formula (I)



wherein R^1 is C_{1-6} alkyl, cyclopropyl, cyclopentyl or cyclohexyl, and R^2 is benzyl; the phenyl moiety of the benzyl substituent being optionally substituted with halogen, C_{1-5} alkyl, halo-C_{1-4} alkyl, halo-C_{1-4} alkoxy, nitro, phenyl, phenoxy, benzyl, optionally halo- substituted benzyloxy, alkylenedioxy, haloalkylenedioxy, amino, mono- or di-C_{1-4} alkylamino, hydroxy, morpholino or carboxy or an alkyl ester thereof, and/or the alkyl moiety of the benzyl is optionally substituted with one C_{1-4} alkyl; or an acid addition salt or metal complex thereof.

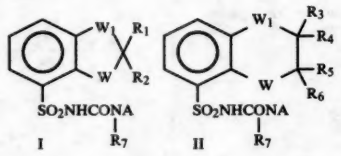
4,595,407

TRIAZINYL-AMINO-CARBONYL-1,3-BENZOHETERO-OR -1,4-BENZOHETERO-SULFONAMIDES

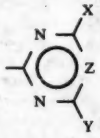
Linda G. Carter, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 437,366, Nov. 1, 1982, Pat. No. 4,502,882, which is a continuation-in-part of Ser. No. 363,379, Mar. 29, 1982, abandoned. This application Sep. 11, 1984, Ser. No. 649,542
Int. Cl.[4] C07D 409/12, 411/12; A01N 43/70, 43/68
U.S. Cl. 71—90 **18 Claims**

1. A compound selected from



wherein
W is O, S, SO or SO_2;
W_1 is O, S, SO or SO_2;
R_1 is H or CH_3;
R_2 is H or C_1–C_4 alkyl;
R_3 is H or CH_3;
R_4 is H or CH_3;
R_5 is H or CH_3;
R_6 is H or CH_3;
R_7 is H or CH_3;
A is



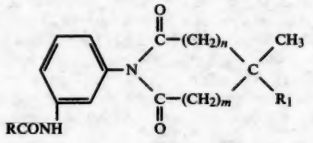
X is CH_3 or OCH_3;
Y is C_2H_5, CH_3, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$, SCH_3, $N(CH_3)_2$, $CH(OCH_3)_2$ or

Z is N;

provided that
W and W_1 may not simultaneously be O.

4,595,408
N-M-PHENYL SUCCINIMIDE AND GLUTARIMIDE DERIVATIVES AND THEIR USE AS HERBICIDES
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Co., Westport, Conn.
Division of Ser. No. 232,329, Feb. 6, 1981, abandoned. This application Nov. 30, 1981, Ser. No. 325,883
Int. Cl.[4] A01N *43/40;* C07D *211/88*
U.S. Cl. 71—94 21 Claims

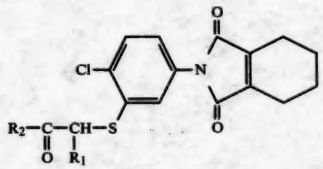
8. A composition of matter comprising
(1) a herbicidally effective amount of the compound have the formula



wherein R is selected from the group consisting of C_{1-C6} alkyl, C_{1-C3} alkylthio and pentafluoroethyl; R_1 is selected from the group consisting of hydrogen, methyl and ethyl; m is 0 or 1; and n is 1 or 2 provided that m+n equals 2, and
(2) an inert carrier.

4,595,409
SUBSTITUTED PHENYL-4,5,6,7-TETRAHYDRO-2H-ISOINDOLE-1,3-DIONES, AND THEIR PRODUCTION AND USE
Toru Haga, Ibaraki; Eiki Nagano, Nishinomiya; Ryo Yoshida, Kawanishi, all of Japan, and Shunichi Hashimoto, Leland, Miss., assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
Filed Aug. 8, 1984, Ser. No. 638,680
Claims priority, application Japan, Aug. 31, 1983, 58-160855
Int. Cl.[4] A01N *43/38;* C07D *209/48*
U.S. Cl. 71—96 13 Claims

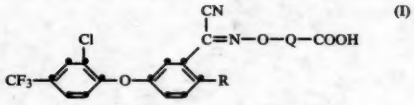
1. A compound of the formula:



wherein R_1 is a hydrogen atom, a fluorine atom or a methyl group and R_2 is a C_1–C_3 alkyl group, a C_1–C_5 alkoxy group, a chloro(C_2–C_4)alkoxy group, a dichloro(C_2–C_4)alkoxy group, a cyclo(C_3–C_7)alkoxy group, a phenoxy group, a C_1–C_5 alkylthio group or a di(C_1–C_5)alkylamino group.

4,595,410
OXIME DERIVATIVES OF DIPHENYL ETHERS AND THEIR USE IN HERBICIDAL COMPOSITIONS
Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Otto Rohr, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation-in-part of Ser. No. 172,312, Jul. 25, 1980, Pat. No. 4,490,167. This application Jan. 7, 1983, Ser. No. 456,471
Claims priority, application Switzerland, Aug. 6, 1979, 7197/79
The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.
Int. Cl.[4] A01N *37/34;* C07C *121/50*
U.S. Cl. 71—105 8 Claims

1. An oxime derivative of a diphenyl ether of the formula I

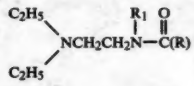


(I)

wherein R is hydrogen, halogen, or a nitro or cyano group, and Q is a straight-chain or branched C_1–C_4alkylene bridge.

4,595,411
METHOD OF INCREASING THE YIELD OF PLANTS UTILIZING N-(2'-DIETHYLAMINOETHYL)ALKYLAMIDES
Lawrence L. Buren, Cupertino, and Don R. Baker, Orinda, both of Calif., assignors to Stauffer Chemical Co., Westport, Conn.
Continuation-in-part of Ser. No. 495,191, May 16, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 707,999
Int. Cl.[4] A01N *37/18, 37/22*
U.S. Cl. 71—118 14 Claims

1. A method of increasing the yield of plants comprising applying thereto a yield-increasing amount of a compound having the formula



wherein R is C_3–C_{14} alkyl or C_3–C_6 alkenyl and R_1 is hydrogen, C_1–C_3 alkyl or phenyl.

4,595,412
PRODUCTION OF MOLYBDENUM METAL
Timothy A. Brunelli, Towanda, and Keith E. Landmesser, Ulster, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.
Filed Jul. 22, 1985, Ser. No. 757,393
Int. Cl.[4] B22F *9/00*
U.S. Cl. 75—0.5 BB 6 Claims

1. A process for producing molybdenum metal from an ammonium molybdate salt comprising:
(a) heating said salt in a reducing atmosphere at a temperature of no greater than about 775° C. for a sufficient time to convert the major portion of said salt to molybdenum dioxide; and
(b) heating said molybdenum dioxide in a reducing atmosphere at a temperature of no greater than about 1095° C. to convert the major portion of said molybdenum dioxide to molybdenum metal.

4,595,413

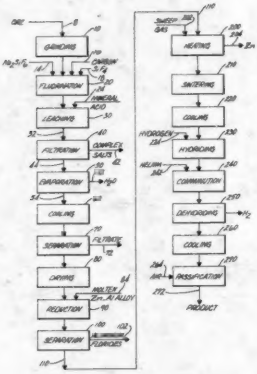
GROUP IVB TRANSITION METAL BASED METAL AND PROCESSES FOR THE PRODUCTION THEREOF

Robert A. Hard, Oley, Pa., and Joseph A. Megy, Corvallis, Oreg., assignors to Occidental Research Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 439,801, Nov. 8, 1982, Pat. No. 4,470,847. This application Jul. 2, 1984, Ser. No. 626,672

Int. Cl.[4] B22F 9/00

U.S. Cl. 75—0.5 BB 70 Claims



1. A powder metal comprising a Group IVb transition metal useful for powdered metallurgical applications characterized as having less than about 50/ppm by weight halide, an internal porosity of from about 10% to about 30% by volume, and the powder comprising angular shaped particles.

4,595,414

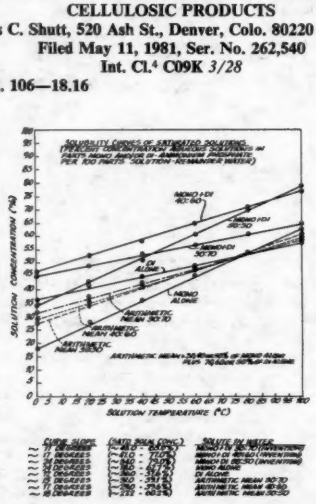
METHODS FOR PRODUCING FIRE RETARDANT CELLULOSIC PRODUCTS

Thomas C. Shutt, 520 Ash St., Denver, Colo. 80220

Filed May 11, 1981, Ser. No. 262,540

Int. Cl.[4] C09K 3/28

U.S. Cl. 106—18.16 27 Claims



1. Method of using a composition consisting essentially of a water-compatible intimate and uniform fire retardent mixture substantially free from water-insoluble ingredients and from alkali and alkaline earths and having a substantially neutral pH in aqueous solution form and being substantially free from consitutents which are able to change such neutral pH to a basic pH, and containing in a ratio by weight substantially between about 30–50% monoammonium phosphate and 70–50% diammonium phosphate and at most up to about 2% free acid, said mixture being composed of finely divided particles in compacted solid pelletized dosage form and additionally containing an effective amount, of by weight substantially between about 0.05–0.3 part per part total monoammonium phosphate and diammonium phosphate, of a corrosion inhibitor or organic constitution provided in stable solution in a water system completely miscible with water and which is able to inhibit corrosion from both acid and basic constituents, for providing an improved composite fire retardant cellulosic product,

said method comprising dissolving the compacted solid pelletized dosage form mixture in sufficient water to provide such mixture as a homogenous mixture in the form of an aqueous solution of substantially neutral pH containing in a 10 part ratio by weight substantially between about 3–7.9 parts total monoammonium phosphate and diammonium phosphate and 7–2.1 parts of water, and substantially intimately intermixing such aqueous solution with cellulosic fiber material in a 100 part ratio by weight of substantially between about 6–16 parts of such solution and 94–84 parts of such cellulosic fiber material and sufficiently to form loose fill fibers of such cellulosic material containing such solution substantially absorbed therein and having a settled bulk density of substantially between about 2.0–3.1 lbs/ft^3.

4,595,415

DRIER CATALYST FOR COATING COMPOSITIONS

Donald C. DuLaney, and Robert H. Lindsay, both of Madison, Wis., assignors to Lindsay Finishes, Inc., Madison, Wis.

Filed Nov. 23, 1984, Ser. No. 674,164

Int. Cl.[4] C09D 3/26; C09F 9/00

U.S. Cl. 106—264 18 Claims

1. In a coating composition comprising one or more polyunsaturated oils, the improvement wherein said composition further includes an effective amount of an oxidative catalyst which comprises a hydrocarbon-soluble coordination complex of tri n-octylphosphine oxide and a manganese salt of a hydrocarbon soluble carboxylic acid.

4,595,416

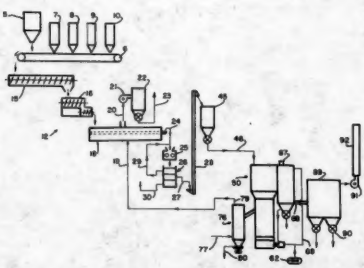
METHOD AND APPARATUS FOR PRODUCING CEMENT CLINKER INCLUDING WHITE CEMENT

Sidney M. Cohen, Allentown, Pa., assignor to Fuller Company, Bethlehem, Pa.

Filed Oct. 1, 1984, Ser. No. 655,820

Int. Cl.[4] C04B 7/36

U.S. Cl. 106—100 12 Claims



1. A process of producing white cement comprising the steps of:

providing cement forming raw materials low in coloring elements;
intermixing water, carbon bearing material and a binder with the cement forming raw materials to form a mixture;
forming the mixture into nodules;
drying the nodules;
sizing the nodules to obtain a feed material having a particle size within a selected size range;
supplying the feed material to a vessel;
passing air upwardly through the material within the vessel to maintain a fluidized bed of material within the vessel;
thermal processing the feed material within the fluidized bed by combustion of the carbon bearing material within the feed material and supplying additional fuel to the fluidized bed for maintaining the fluidized bed at a temperature in the range of approximately 2500° to 2700° F.;
discharging cement clinker from the fluidized bed by displacement; and
cooling the discharged clinker;
the carbon bearing material which is intermixed with the feed material being in an amount between about 5 to 9% by weight and supplying about 60 to 90% of the process fuel requirements whereby reducing conditions are maintained internally within the particles of feed material.

4,595,417

PROCESS FOR TREATING AQUEOUS SLURRY OF PIGMENT

Takeomi Murakami, and Nobuo Ishikawa, both of Yokohama, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka; Takeomi Murakami, Yokohama and Daido Kasei Kogyo Kabushiki Kaisha, Tokyo, all of, Japan

Filed Oct. 29, 1984, Ser. No. 665,850
Claims priority, application Japan, Oct. 29, 1983, 58-204547
Int. Cl.[4] C04B *14/00*; C09C *1/00*
U.S. Cl. 106—309 **4 Claims**

1. A process for treating an aqueous slurry of pigment which comprises
adding to the aqueous slurry a halogenated hydrocarbon medium which is liquid at room temperature and has at least one halogen selected from the group consisting of fluorine atom and chlorine atom in its molecule;
agitating the aqueous slurry vigorously to cause the halogenated hydrocarbon medium to replace water as the medium wherein the pigment is dispersed;
separating the pigment in the form of a cake containing the pigment and the halogenated hydrocarbon medium; and
drying the cake to remove the halogenated hydrocarbon medium by evaporation.

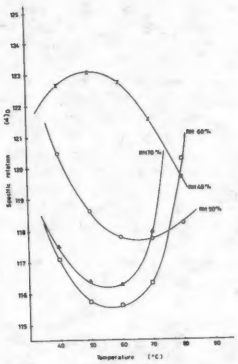
4,595,418

PRODUCTION OF POWDERY MALTOSE

Zenichi Yoshino, Kashihara, Japan, assignor to Sanwa Kosan Kabushiki Kaisha, Kashihara, Japan

Filed Oct. 23, 1984, Ser. No. 663,919
Claims priority, application Japan, Oct. 25, 1983, 58-199862
Int. Cl.[4] C13K *7/00*
U.S. Cl. 127—30 **5 Claims**

1. A method of producing powdery crystalline maltose characterized by a high concentration of the beta-anomer of maltose monohydrate comprising the steps of
(1) obtaining a high purity maltose solution with a sugar composition of not less than 90% of maltose and not more than 2.5% of maltotriose by enzymatic saccharification of a liquefied starch solution characterized by a low degree of hydrolysis,
(2) concentrating said high purity maltose solution to a solid content of 65 to 80%,
(3) adding seed crystals containing beta-maltose monohydrate to the concentrated solution,
(4) conducting a primary crystallization whereby maltose monohydrate crystals are precipitated at a temperature of 25±5° C. until the degree of crystallization reaches 50±5%,
(5) spray drying the resulting massecuite to obtain a powdery product having a water content of 5.5–7.5%, and



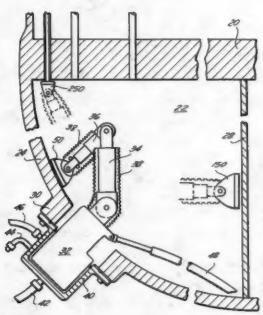
(6) aging the powder product by exposing it immediately after the spray-drying to an atmosphere wherein the temperature is 50°–75° C., the relative humidity is 50–70%, and the absolute humidity is 45–185 g water/kg dry air to convert alpha-maltose to beta-maltose and complete the crystallization of maltose monohydrate.

4,595,419

ULTRASONIC DECONTAMINATION ROBOT

Richard S. Patenaude, Old Saybrook, Conn., assignor to Proto-Power Corporation

Filed Dec. 27, 1982, Ser. No. 453,762
Int. Cl.[4] B08B *3/12*
U.S. Cl. 134—1 **6 Claims**



1. A method of removing radioactive contamination from a primary fluid header of a steam generator between periods of active operation thereof, the header having a sealable access manway therein to permit access to interior surfaces of the header, comprising the steps of
inserting through the header manway into the interior thereof a robotic arm having a base portion sized to fit sealably in said manway, an ultrasonic decontamination head disposed to be movable at an end of said robotic arm, a solvent supply tube connected to said decontamination head, and a fluid removal conduit disposed at a low point in the interior of said header;
sealing said base portion in said header manway;

connecting a remotely positioned solvent processing device to said supply tube and said fluid removal conduit; and

connecting a remotely positioned robotic controller to said robotic arm to supply ultrasonic power to said ultrasonic decontamination head and to supply position signals to said robotic arm to position the ultrasonic decontamination head against at least one of said surfaces while fluid solvent is supplied through said supply tube to said head and said ultrasonic decontamination head produces ultrasonic acoustic waves such that any radioactive surface contaminants are loosened and flushed from said at least one surface and the loosened contaminants in said fluid solvent are removed from said interior by said fluid removal conduit and transferred to said solvent processing device, said ultrasonic decontamination head further generating, in addition to said ultrasonic acoustic waves for loosening surface contaminants, additional ultrasonic waves for sensing distance of said head from an interior surface of said header, and sensing said additional ultrasonic waves with a sensor in said head; and the method further comprising determining a standoff distance of said head from said surface based on the sensed ultrasonic waves.

4,595,420

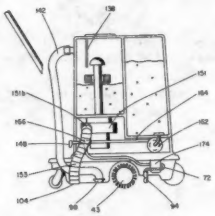
METHOD AND APPARATUS FOR CLEANING AND MAINTAINING CARPET

Robert C. Williams, III, 11309 Derby Dr., Raleigh, N.C. 27612; Stephen R. Williams, 304 Howland Dr., Cary, N.C. 27511, and Robert R. Weil, 11613 Coachmans Way, Raleigh, N.C. 27614

Filed Oct. 29, 1984, Ser. No. 666,120

Int. Cl.[4] B08B 5/04

U.S. Cl. 134—6 **24 Claims**



14. A method of cleaning and maintaining large areas of carpet in a single pass using a fully integrated carpet cleaning machine comprising the steps of:

A. rotating an elongated cylindrical brush on said carpet cleaning machine and engaging said brush with an underlying carpet;

B. moving said carpet cleaning machine forwardly over the underlying carpet;

C. applying a cleaning solution to the underlying carpet as said carpet cleaning machine is moved forwardly across the same;

D. agitating the cleaning solution in the carpet by continuing to rotate said cylindrical brush as said carpet cleaning machine is moved forwardly across the underlying carpet;

E. floating a vacuum head secured to said carpet cleaning machine over said underlying carpet rearwardly of said cylindrical brush so said vacuum head moves upwardly and downwardly in response to the undulation of the underlying carpet as said carpet cleaning machine is moved forwardly over said underlying carpet;

F. vacuuming the cleaning solution from said underlying carpet by passing a system of moving air over said carpet and into said vacuum head and effectively lifting the cleaning solution from the underlying carpet as said carpet cleaning machine is moved forwardly over said underlying carpet;

G. separating said cleaning solution from said system of moving air by passing the system of moving air through a recovery tank secured within said carpet cleaning machine which captures and holds the cleaning solution while the system of moving air continues to move; and

H. drying the carpet as the carpet cleaning machine is moved forwardly across said underlying carpet and after the cleaning solution is removed therefrom by directing the system of moving air through an outlet secured to said carpet cleaning machine adjacent to and behind said vacuum head and onto the underlying carpet such that the carpet cleaning machine sequentially applies a cleaning solution to the carpet, removes the cleaning solution and associated dirt and debris from the carpet, and dries the carpet in a single pass as the machine is propelled in the selected direction.

20. An industrial type carpet cleaning and maintenance machine for cleaning low pile carpets as the machine is propelled over the same comprising: a mobile frame structure having a cleaning undercarriage; a supply tank mounted on said mobile frame structure for holding a carpet cleaning solution; means associated with said carpet cleaning machine for directing carpet cleaning solution from the supply tank onto the underlying carpet; brush means secured to said undercarriage for agitating the carpet cleaning solution on the underlying carpet as said carpet cleaning machine is propelled over the same; drive means operatively associated with said brush means for driving the same, said drive means including an electric motor and impact starter means operatively connected between said electric motor and said brush for sequentially separating the brush starter load from the electric motor starting load; vacuum means associated with said carpet cleaning machine for removing the carpet cleaning solution from the underlying carpet, said vacuum means including a vacuum head secured to said undercarriage and a blower communicatively connected to said vacuum head for generating a system of moving air and inducing the same into said vacuum head wherein said moving air tends to lift the cleaning solution from the carpet and transfer the same into said vacuum head, said vacuum head means further including a recovery tank mounted on said frame mobile frame structure and communicatively connected between said vacuum head and said blower for receiving the system of moving air from said vacuum head and for separating and retaining the cleaning solution contained therein as the system of moving air passes therethrough to the blower; and carpet drying means including a drying outlet secured to said undercarriage and communicatively connected to said blower so that the system of moving air generated by said blower passes through the same to said dry outlet where said system of moving air is directed onto the underlying carpet for drying the same.

4,595,421

METHOD FOR CLEANING ELECTRODES

Harry T. Redhead, P.O. Box 892, Chase B.C., Canada, and Robert D. H. Willans, 1704 Topping St., Trail B.C., Canada (V1R 4G3)

Continuation-in-part of Ser. No. 387,261, Jun. 9, 1982, abandoned. This application Oct. 11, 1984, Ser. No. 660,490

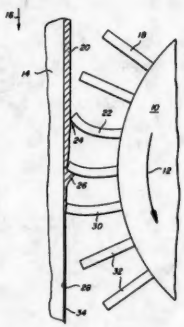
Claims priority, application Canada, Jun. 30, 1981, 380876

Int. Cl.[4] B08B 1/04

U.S. Cl. 134—6 **25 Claims**

1. A dry method for the removal of at least a portion of a removable layer of adhering impurity substances from at least one surface of an electrode used in the electrolytic deposition of metals, which method comprises contacting the electrode surface with at least one cleaning means consisting of a rotating

member which has attached thereto a plurality of radially projecting flexible fingers having a length to diameter ratio of



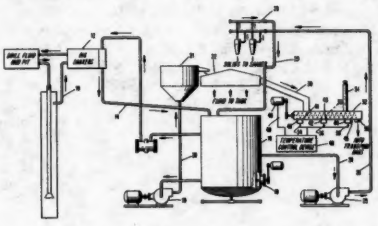
about 3.56:1 and wherein the axis of rotation of the rotating member is substantially parallel to the surface of the electrode.

4,595,422

DRILL CUTTING DISPOSAL SYSTEM

Kenton C. Hill, Harvey, and Darryl A. Schonacher, Labadieville, both of La., assignors to CDS Development, Inc., New Orleans, La.

Filed May 11, 1984, Ser. No. 609,238
Int. Cl.[4] B08B *3/10, 7/04*
U.S. Cl. 134—19 **14 Claims**



1. A method of removing fluids and hydrocarbons in a fluids-solids mixture comprising the steps of:

(a) shaking the mixture removing a major portion of the fluids from the fluids-solids mixture;

(b) immersing the solids in a tank containing a chemical solution capable of removing hydrocarbons from the solids;

(c) agitating the solids in the chemical solution in the tank to facilitate the chemical removal of hydrocarbons from the solids and to break the solids into smaller particles;

(d) shaking the solids from the tank at a higher speed than the first shaking to further separate fluid from solids;

(e) centrifuging fluid removed by said high speed shaking removing fine particles of solids;

(f) heating the solids to vaporize off substantially all of the remaining fluids and hydrocarbons from the solids; and

(g) discharging all of said solids for disposal.

4,595,423

METHOD OF HOMOGENIZING A COMPOUND SEMICONDUCTOR CRYSTAL PRIOR TO IMPLANTATION

Shintaro Miyazawa, Isehara, and Shigeo Murai, Osaka, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Aug. 29, 1984, Ser. No. 645,350
Claims priority, application Japan, Sep. 9, 1983, 58-165155
Int. Cl.[4] H01L *21/263, 21/477*
U.S. Cl. 148—1.5 **14 Claims**

1. A method of upgrading the uniformity of a compound semiconductor crystal, which comprises heat treating a substrate comprising said compound semiconductor crystal, prior to ion implantation of said substrate, in an inert atmosphere at a temperature which is at least as high as the activating temperature after ion implantation.

4,595,424

METHOD OF FORMING PHOSPHATE COATING ON ZINC

Kenneth J. Hacias, Sterling Heights, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Filed Aug. 26, 1985, Ser. No. 769,433
Int. Cl.[4] C23C *22/12, 22/18*
U.S. Cl. 148—6.15 R **15 Claims**

1. An improved method for coating a zinc surface comprising treating said surface with an aqueous, acidic solution containing:

(a) about 0.5 to about 4 percent phosphate ion;

(b) an ion selected from the group consisting of zinc ions, manganese ions, and mixtures thereof, said ions being present at a level sufficient to form dihydrogen phosphate with substantially all of said phosphate ions; and

(c) about 0.01 to about 1 percent complex fluoride ions; and

(d) measuring the chloride ion concentration and maintaining the weight:weight ratio of complex fluoride ions:chloride ions in said solution at a value of about 8:1 or greater.

4,595,425

CORROSION INHIBITING QUENCHANT COMPOSITIONS

Ronald H. Harding, Westport, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

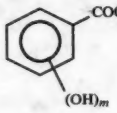
Filed Mar. 29, 1985, Ser. No. 717,545
Int. Cl.[4] C21D *1/56*
U.S. Cl. 148—18 **31 Claims**

1. An aqueous organic polymer containing composition

having incorporated therein a corrosion inhibiting system which comprises:

(A) an effective amount of a water-soluble aromatic carboxylic acid or salt thereof having one or two aromatic rings and at least one nitro substituent; and

(B) at least a potentiating amount of a water soluble compound of the formula:



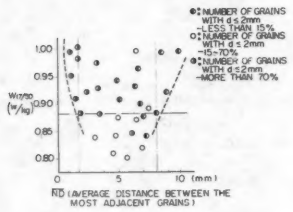
wherein M^1 is hydrogen or an organic or inorganic cation and m is 1 or 2.

4,595,426

GRAIN-ORIENTED SILICON STEEL SHEET AND PROCESS FOR PRODUCING THE SAME

Kenzo Iwayama; Yasunari Yoshitomi, and Katsuro Kuroki, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,419
Int. Cl.[4] C04B *35/00*
U.S. Cl. 148—31.55 **3 Claims**



1. A grain-oriented silicon steel sheet, containing from 2.3% to 4.3% of silicon and 0.0020% or less of each of carbon, nitrogen, and sulfur and having a sheet thickness of from 0.15 to 0.23 mm, wherein crystal grains having 2 mm or less circle-equivalent diameters are present in an amount of from 15% to 70% based on the total number of crystal grains; and, further an average nearest intergrain distance ($\overline{ND}$) of said crystal grains of 2 mm or less circle-equivalent diameter is from 2.0 to 8.0 mm ($\overline{ND}$=2.0 to 8.0 mm); $B_{10} \geqq 1.89$ T and $W_{17/50} \leqq 0.88$ w/kg.

4,595,427

ANNEALING PROCESS CONTROL METHOD AND APPARATUS

Robin A. L. Drew, Montreal; Wilson B. Muir, Sutton, and William M. Williams, Westmount, all of Canada, assignors to The Royal Institution for the Advancement of Learning (McGill University), Montreal, Canada

Filed Oct. 22, 1984, Ser. No. 663,410
Int. Cl.[4] C21D *11/00*
U.S. Cl. 148—129 **8 Claims**

1. An arrangement for following and controlling the progress of annealing during heat treatment of cold worked metals which heat treatment is carried out in an annealing furnace;

said arrangement comprising:

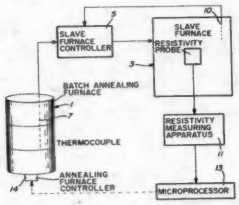
a slave furnace;

a slave furnace controller connected to said slave furnace to control the temperature thereof;

means for measuring the temperature in said annealing furnace;

said means for measuring the temperature in said annealing furnace being connected to said slave furnace controller to provide information concerning the temperature of said annealing furnace to said slave furnace controller, whereby to control the temperature of said slave furnace to follow the temperature of said annealing furnace;

a sample arrangement including a shaped segment of said cold worked material and a standard comprising a separate like shaped segment of said cold worked material



which has been previously annealed, the two segments being of equal size and being disposed in close proximity, said sample arrangement being disposed in said slave furnace;

means for measuring the differential resistivity between said shaped segment and said standard;

annealing furnace controller means for controlling the temperature of said annealing furnace;

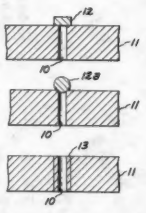
said means for measuring the differential resistivity being connected to said annealing furnace controller whereby to follow and control the progress of annealing.

4,595,428

METHOD FOR PRODUCING HIGH-ASPECT RATIO HOLLOW DIFFUSED REGIONS IN A SEMICONDUCTOR BODY

Thomas R. Anthony, Schenectady; Douglas E. Houston, Liverpool, and James A. Loughran, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,708
Int. Cl.[4] H01L *21/228*
U.S. Cl. 148—187 **4 Claims**



1. In the method of preparing a semiconductor device wherein a semiconductor body is provided with a bore by multipulse laser drilling, said bore having a diameter of less than about 1.5 mils and extending completely through said body with the average length-to-diameter ratio thereof being at least about 6:1, the improvement wherein a molten metal-rich droplet is migrated along the inside surface of the bore throughout the length of the bore, said droplet containing atoms of metal selected from the group consisting of aluminum, indium, gallium, antimony, gold, silver, and tin.

4,595,429
AMORPHOUS OR MICROCRYSTALLINE ALUMINUM-BASE ALLOYS

Gérard Le Caër, Nancy, and Jean-Marie Dubois, Pompey, both of France, assignors to Centre National de la Recherche Scientifique "CNRS" , Paris, France

Filed Jun. 23, 1983, Ser. No. 506,993
Claims priority, application France, Jul. 6, 1982, 82 12404
Int. Cl.[4] C22C *0/00*
U.S. Cl. 148—403 7 Claims

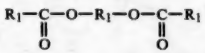
1. A substantially amorphous or microcrystallized Al-based alloy, said alloy being of the formula: $Al_aM_bCu_{b'}M_{c'}X_dY_e$, wherein $a+b+b'+c+d+e=100$ and $50 \leqq a \leqq 95$ atom %, $15 \leqq b \leqq 40$ atom %, $6 \leqq b' \leqq 25$ atom %, $0 \leqq c \leqq 15$ atom %, $0 \leqq d \leqq 20$ atom % and $e \leqq 1$ atom %, and wherein M is an element selected from the group consisting of Mn, Ni, Zr, Cr, Ti, V, Fe and Co; M′ is an element selected from the group consisting of Mo, W and mixtures thereof; X is an element selected from the group consisting of Ca, Li, Mg, Ge, Si and Zn; and Y represents the inevitably present impurities.

4,595,430
DESENSITIZED DYNAMITES

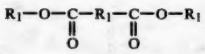
James J. Baker, Sugarloaf, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed May 7, 1984, Ser. No. 607,773
Int. Cl.[4] C06B *25/00*
U.S. Cl. 149—88 18 Claims

1. A dynamite composition of at least nitrate esters, oxidizer salts, carbonaceous fuel, antiacid the improvement comprising: the incorporation of from about 0.5 to about 3.0% by weight of a desensitizer selected from the group consisting of:



and



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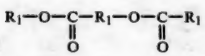


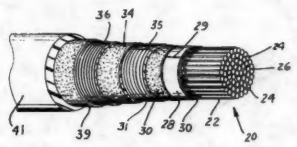
and

wherein R_1 is a C_3 to C_{10} group, but not a benzyl ring, which can contain elements other than carbon and hydrogen, and R_2 is a C_8 to C_{20} group and R_3 is a C_1 to C_3 group.

4,595,431
METHODS OF AND APPARATUS FOR APPLYING A WATERPROOFING MATERIAL TO A CABLE CORE WRAP

William D. Bohannon, Jr., Lawrenceville; Alfred S. Hamilton, and Danny E. West, both of Norcross, all of Ga., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jan. 28, 1985, Ser. No. 695,337
Int. Cl.[4] H01B *13/10*
U.S. Cl. 156—54 16 Claims



1. A method of enclosing a cable core with a strip of plastic material having a waterproofing material applied to at least one major surface thereof, said method including the steps of:

advancing a cable core along a path of travel;

advancing a strip of plastic material along a path which is juxtaposed to the path of the core;

causing a waterproofing material to be applied to at least one major surface of the strip;

Disposing a metering member transversely across the one major surface of the advancing strip;

holding a portion of the advancing strip spaced from the metering member to control the quantity and the distribution of the waterproofing material that remains on the one major surface of the strip as the strip is advanced past the metering member; and

wrapping the strip about the advancing core to form a cover having a longitudinal overlapped seam with the quantity and distribution of waterproofing material remaining on the one major surface being sufficient to cause waterproofing material to become disposed in the seam.

4,595,432
Patent Not Issued For This Number

4,595,433
APPARATUS FOR HEAT SEALING THERMOPLASTICS STRAPS

Graham Ford, Cambridge, and Donald Sutehall, Harlow, both of England, assignors to Gerrard Industries Limited, South Yorkshire, England

Filed Feb. 15, 1985, Ser. No. 702,124
Claims priority, application United Kingdom, Feb. 16, 1984, 8404062
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—64 16 Claims

1. In apparatus for heat sealing thermoplastics strap material comprising a portable tool adapted to receive two sections of

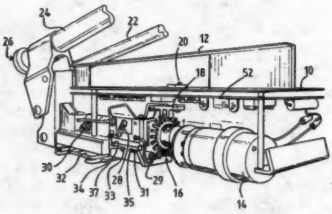
strap material which are to be welded together and having a heating element, drive means for moving the heating element between the straps and a battery source for supplying heating current to the heating element;

the improvement comprising:

control circuit means for detecting the battery voltage on load and producing a speed control signal, and

drive control means responsive to the speed control signal to control the speed of movement of the heating element between the straps in dependence on the detected voltage level.

12. In a method for heat sealing thermoplastics strap material comprising the steps of:



inserting into a portable tool containing a heating element, two sections of strap material which are to be welded together, and locating the strap sections above and below the heating element;

driving the heating element in a reciprocal motion between the straps;

supplying electric power to the element from a battery source during the reciprocal motion to heat and fuse the two straps;

the improvement comprising the steps of:

detecting the battery voltage on load, and

controlling the speed of the heating element between the straps in dependence on the detected voltage level.

4,595,434

COLLAPSIBLE DISPENSING TUBE WITH AN ORIFICE SEALED WITH MULTI-LAYER SEALANT SHEET MATERIAL

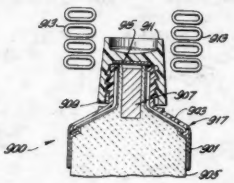
John P. Eckstein, Neenah, Wis.; William S. Gillespie, Barrington, Ill., and Suzanne E. Schaefer, Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Sep. 15, 1983, Ser. No. 532,440

Int. Cl.[4] B29C *27/00*

U.S. Cl. 156—69 **4 Claims**

1. A method of hermetically sealing a collapsible dispensing tube, wherein the tube includes a headpiece having a dispensing orifice therein and a body extending from said headpiece, said method comprising placing said tube over a working mandrel, placing a generally cylindrical ferrite material in the neck portion of said headpiece in spaced relation to the interior of said neck portion and said orifice, placing a multiple layer sheet material across said dispensing orifice and apply radio frequency energy thereto to hermetically seal said orifice, said multiple layer sheet material comprising first and second layers of metal foil and a third layer of a polymer disposed between said first and second layers and firmly adhered thereto, and a fourth layer of polymer outside the composite structure of said



first, second and third layers, and firmly adhered to said first layer, said fourth layer comprising said first outer surface layer of said sheet material and being the functional means of keeping said sheet material adhered to said headpiece.

4,595,435

METHOD FOR PRODUCING LINING PANELS WHICH ARE CAST INTO CONCRETE AS AN INTEGRAL LINING

Ernst Rohringer, Osterreich, Fed. Rep. of Germany, assignor to Steuler-Industriewerke GmbH, Grenzhausen, Fed. Rep. of Germany

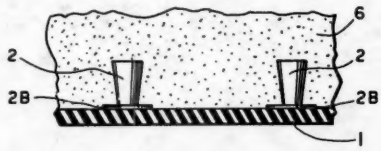
Continuation of Ser. No. 356,469, Mar. 9, 1982, Pat. No. 4,508,581. This application Apr. 1, 1985, Ser. No. 718,071

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 31089720

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] B29C *65/06, 65/08*

U.S. Cl. 156—73.1 **7 Claims**



1. A method of producing large area lining panels for poured concrete structures, the method comprising the steps of:

providing a sheet-like panel composed of thermo-plastic material, each panel having a front face and a rear face;

providing a plurality of anchoring knobs composed of thermoplastic material, each anchoring knob having a body with a first end and a second end and an attachment portion integrally formed at the first end of the body;

placing the contact surface of the attachment portion of each anchoring knob in contact with the rear face of the panel in predetermined spaced relation to other ones of the plurality of knobs; and

effecting frictional heating of the immediate region of contact between each anchoring knob and the panel sufficient to fuse the contact surface of the knob and the contacted surface of the panel to weld the anchoring knobs to the panel, whereby each knob is adapted to distribute shear and tension forces to the panel when the knob is embedded in a poured concrete structure abutting the rear face of the panel.

4,595,436

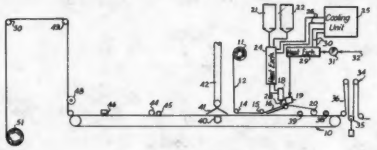
METHOD FOR APPLYING POLYURETHANE BACKING

Paul Walker, 2606 W. Lake Park, Rocky Face, Ga. 30740; Glen F. Hamrick, 3200 Summer Rd., Tunnel Hill, Ga. 30755, and B. Lamar Sosebee, Resaca, Ga., assignors to Paul Walker, Rocky Face and Glen F. Hamrick, Tunnel Hill, both of, Ga.

Continuation-in-part of Ser. No. 554,210, Nov. 22, 1983, Pat. No. 4,515,646. This application Aug. 31, 1984, Ser. No. 646,415

Int. Cl.[4] B32B *5/20, 31/22, 31/26*

U.S. Cl. 156—79 13 Claims



1. A method for providing a cushion of foamed polyurethane having a fabric on at least one side of said cushion, said method including the step of coating one side of a first sheet with components for forming a foamed polyurethane, said components being such as to begin reaction on being heated by passing steam through said components so that said steam both heats said components and adds water for reaction with said components, inverting said first sheet and placing said coated one side of said first sheet down against a second sheet that is below the first sheet for forming a sandwich of said polyurethane forming components between the sheets, said second sheet comprising a fabric pervious to steam, moving said sandwich across a steam box and continuously steaming said sandwich for adding water, heating said components and initiating the reaction of said polyurethane forming components, and allowing complete reaction of said components with said first sheet on the upper surface.

4,595,437

METHOD OF PRODUCING A WARMTH KEEPING VESSEL MADE OF CERAMICS OR PORCELAIN

Masashige Yamamoto, c/o Yamamoto Seisakusho Ltd., 989-3, Iwasa, Miyama-cho, Yamagata-gun, Gifu-prefecture, Japan

Filed Sep. 26, 1984, Ser. No. 654,788

Claims priority, application Japan, Nov. 21, 1983, 58-219280; Jul. 7, 1984, 59-141095

Int. Cl.[4] B32B *18/00, 31/26*

U.S. Cl. 156—87 4 Claims

1. A method of producing a warmth keeping vessel made of ceramics characterized in that an inner vessel and outer vessel forming a warmth keeping ceramic vessel of a double-walled structure are respectively simply baked, are overlapped on each other so as to form a hollow chamber, are then enamel bonded by the painting of an enamel on the joint formed between the inner vessel and the outer vessel, are heated at a temperature of at least 1000° C. which is sufficient to effect discharge of the air in the hollow chamber through said joint but which will not effect the melting of the enamel, and are further fired at a temperature higher than the melting point of said enamel so as to be bonded together to keep the hollow chamber air tight under a reduced pressure.

4,595,438

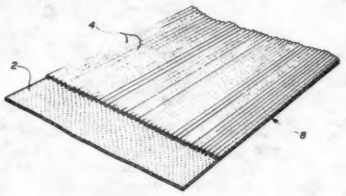
PROCESS FOR MAKING A YARN COVERED FABRIC

Raymond C. Kent, and Charles Haines, Jr., both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Nov. 5, 1984, Ser. No. 667,994

Int. Cl.[4] B32B *31/16*

U.S. Cl. 156—148 1 Claim



1. The method of making a fabric backing with laminated yarn thereon, comprising the steps of:

(a) providing a fabric backing sheet with an upper surface,

(b) coating the upper surface of the fabric with an adhesive coating,

(c) placing fiber yarn on the upper surface of the fabric in contact with the adhesive to position and hold a plurality of the yarns in parallel rows, and

(d) needling the yarn covered fabric with a plurality of needles to pierce the fabric backing wi

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4,595,439

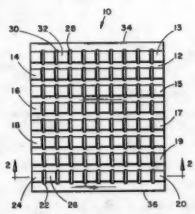
PROCESS OF FORMING A MULTIPLE PROFILE REAGENT CARD

David L. Boger, South Bend, Ind.; Leighton C. Johnson, Edwardsburg, Mich., and Jerry T. Pugh, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 511,269, Jul. 6, 1983, Pat. No. 4,526,753. This application Feb. 13, 1985, Ser. No. 701,184

Int. Cl.[4] B32B *31/12, 31/18;* G01N *33/52*

U.S. Cl. 156—178 4 Claims



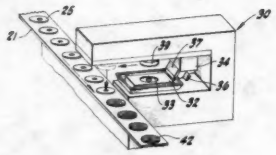
1. A process of forming a multiple profile reagent card for simultaneously or sequentially performing multiple analyses of analyte comprising applying, in a continuous manner, ribbons of reagent impregnated matrix material parallel to and spaced apart from each other on a substrate and then cutting slots completely through the ribbons and substrate perpendicular to the length of the ribbons at selected intervals along each ribbon to form matrices separated by slots along each ribbon of matrix material, whereby runover between adjacent matrices along each ribbon of matrix material is substantially prevented.

4,595,440

TRANSFER PROCESS FOR FORMING MAGNETIC DISK MEMORIES

Gregory R. Lynch, Saratoga, Calif., assignor to Memron Inc., San Jose, Calif.

Filed Dec. 8, 1983, Ser. No. 559,396
Int. Cl.[4] B32B *31/24*
U.S. Cl. 156—230 30 Claims



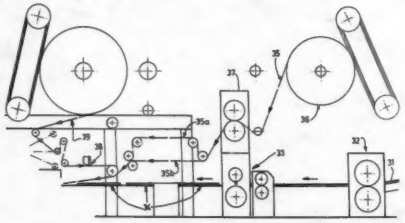
1. A process for forming a magnetic coating on a supporting substrate comprising depositing a liquid dispersion of magnetic material in a mold having a nominal depth and an upper surface, passing a blade along the upper surface to remove excess liquid and precisely define the coating thickness and configuration and, using a compliant transfer media, picking up the formed liquid dispersion of magnetic material from the mold and transferring the liquid dispersion to the supporting substrate to form a magnetic coating thereon, then drying the coating.

4,595,441

FABRICATION METHOD FOR DISPOSABLE ARTICLES AND A LIQUID-ABSORBING DISPOSABLE ARTICLE

Marcel Holvoet, Louviers; Sem Mitrani, Ris Orangis, and Raymond Pigneul, Durrenentzen, all of France, assignors to Beghin-Say S.A., Thumeries, France

PCT No. PCT/FR83/00023, § 371 Date Nov. 1, 1983, § 102(e) Date Nov. 1, 1983, PCT Pub. No. WO83/03051, PCT Pub. Date Sep. 15, 1983
PCT Filed Feb. 3, 1983, Ser. No. 552,147
Claims priority, application France, Mar. 2, 1982, 82 03409
Int. Cl.[4] B32B *31/08;* B65C *9/25*
U.S. Cl. 156—265 6 Claims



1. A continuous method for the fabrication of disposable articles designed to absorb liquids comprising the steps of

(a) cutting a continuous impermeable foil (**45**) into first and second continuous strips (**45***a*,**45***b*) and in its median zone along a lay-out to provide a cut-out area comprising a series of straight-line sections (T_1, T_2, T_3 . . .) parallel to the longitudinal axis (XX') of the foil, whereby said straight-line sections are alternatingly staggered on either side of said axis with the distance between two consecutive sections located on the same side of the foil axis exceeding the length (l) of the sections, with the ends of said sections being connected by connecting sections (T_{12}', T_{23}' . . .) intersecting the foil axis at their center, said first strip (**45***b*) being laterally shifted by a distance slightly less than the distance (d_1) between the straight line section and the longitudinal axis, and then longitudinally by a length equal to the cutting repeat (T) so that two straight line sections are symmetrical with respect to said axis, with said second strip (**45***a*) following a longer path than the first (**45***b*) and exceeding the length of said first strip by the repeat (T) of the cut-out;

(b) depositing said first and second strips on an absorbing material in such a manner whereby open zones bounded by said strips are located in the central region of said absorbing material; and

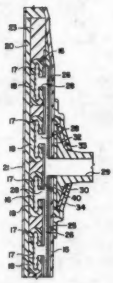
(c) cutting the sheath so obtained into individual articles.

4,595,442

METHOD OF MAKING A PNEUMATIC DEICER BY VACUUM PRESSING UTILIZING A CURABLE RUBBER-CROSS-LINKED RUBBER COMPOSITION

Bernard F. Trares, Cuyahoga Falls, and Robinson F. Nichols, Stow, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 182,531, Aug. 29, 1980, Pat. No. 4,361,298, which is a continuation-in-part of Ser. No. 884,923, Mar. 9, 1978, abandoned. This application Mar. 1, 1982, Ser. No. 353,535
Int. Cl.[4] B32B *31/26;* B64D *15/16*
U.S. Cl. 156—286 4 Claims



1. A process for the fabrication of an inflatable deicer boot comprising the steps of:

providing a plurality of elastomeric tubular members having passageways therethrough defined by a fabric coated on one side with a natural rubber nonflowable under conditions whereby the rubber is vulcanizable, the natural rubber being at least 1% by weight cross-linked natural rubber, and an interior wall surface of the tubular member defining the passageway and being defined by the fabric,

mounting the plurality of tubular members in a laterally spaced realtionship on a lower, vulcanizable elastomeric ply of material;

laying a manifold ply having a central passageway therein across said tubular members whereby said central passageway in said manifold ply communicates with in said tubular members;

overlaying said lower ply, tubular members and manifold ply with an upper ply of vulcanizable material to form the deicer boot;

drawing a vacuum on said manifold and passageways said passageways in said tubular members;

vulcanizing said deicer boot into a unitary structure; and

connecting an inflation valve to said manifold through said upper ply.

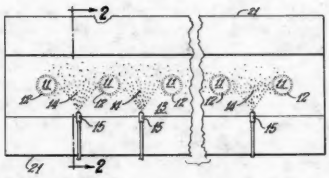
4,595,443
POLLUTION-REDUCING METHOD OF INCORPORATING DUST SUPPRESSANT IN FIBROUS INSULATION MATERIAL

David C. Trumbore, Newark, and William A. Kays, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 521,482, Aug. 8, 1983, abandoned. This application May 2, 1985, Ser. No. 729,092

Int. Cl.[4] C03B *32/00;* **C03C** *25/02*

U.S. Cl. 156—296 **7 Claims**



1. In a process for making a fibrous product which comprises directing a plurality of steams, arranged in a row, of hot gas in which fibers and a binder, optionally mixed with a dust suppressant, are entrained, through a surrounding region of substantially cooler gas into a deposition zone wherein the entrained fibers are deposited to form a more-or-less randomly entangled fibrous mass, said region of cooler gas communicating with said deposition zone, the improvement comprising introducing dust suppressant, or a precursor thereof, into said surrounding region of cooler gas at a plurality of points arranged in a row parallel to and horizontally offset from said row of hot gas streams and respectively disposed between streams of pairs of adjacent hot gas streams, whereby said last mentioned dust suppressant or precursor is deposited in said fibrous mass in said deposition zone substantially without entrainment in said streams of hot gas.

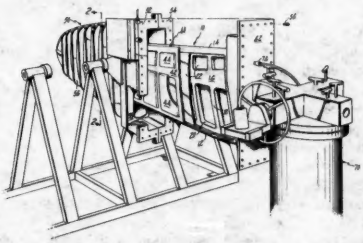
4,595,444
ISOSTATIC DIE AND METHOD FOR ASSEMBLY OF SKELETAL STRUCTURES

John R. Legge, and Charles E. Nunley, both of Huntsville, Ala., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 14, 1983, Ser. No. 551,748

Int. Cl.[4] B21K *3/04;* **B23P** *15/04;* **B32B** *31/20*

U.S. Cl. 156—285 **5 Claims**



1. An assembly for the attachment of a skin to a skeletal frame of the type of which has various ribs defining open portions therethrough, comprising:

a first die means including a sheet on which a plurality of particularly sized rigid plates are fixedly mounted, said first die being positioned on one side of said skeletal frame against said skin;

a second die means including a sheet on which a plurality of particularly size rigid plates are fixedly mounted thereon, said rigid plates on said second die and said rigid plates on said first die being oppositely aligned and bridging the openings in said skeletal frame;

a chamber, sized to receive an assembly comprised of said first die means and said second die means, including a flexible bladder sized to enclose said first die means and said second die means; and

fluid pressure means for supplying a fluid under pressure to said chamber for urging said flexible bladder and said plurality of particularly sized rigid plates bridging the opening in said skeletal frame against the rib portion of said skeletal frame thereby preventing deformation or damage to said skin adjacent openings in said skeletal frame.

4,595,445
ADHESIVE JOINING OF SURFACES USING THERMOSETTING POLYURETHANE UREA REACTIVE ADHESIVE COMPOSITIONS

Rudolf Hombach, Leverkusen; Manfred Dollhausen, Odenthal; Heinrich Hess; Gerhard Grögler, both of Leverkusen; Richard Kopp, Cologne, and Artur Reischl, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 24, 1985, Ser. No. 694,561

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403499

Int. Cl.[4] C09J *5/02*

U.S. Cl. 156—307.3 **20 Claims**

1. In the adhesive joining of two surfaces wherein an adhesive is first applied to at least one of the surfaces and the surfaces are then brought into contact with each other, the improvement wherein the adhesive is a thermosetting reactive adhesive

(i) which is flowable or readily meltable at ambient or slightly elevated temperature,

(ii) which is stable in storage at ambient temperature,

(iii) which sets quickly at temperatures of 80° C. or more,

(iv) which comprises:

(A) a surface-modified, finely-divided polyisocyanate wherein from 0.1 to 25 equivalent percent of the isocyanate groups of the unmodified polyisocyanate have been deactivated, and

(B) a member selected from the group consisting of

(a) aliphatic and/or aromatic polyamines having molecular weights of from 400 to 6000,

(b) aromatic polyamines having molecular weights of from 108 to 399, and

(c) mixtures thereof, and

(v) which can be activated by application of heat, polar solvents and/or high shearing forces.

4,595,446
SOLVENT BONDING PROCESS UTILIZING SPRAY-MIST

Raymond K. Newkirk, Mound, and Ronald J. Dickmeyer, Medicine Lake, both of Minn., assignors to Tape, Inc., Minneapolis, Minn.

Filed Apr. 24, 1985, Ser. No. 726,783

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—356 **6 Claims**

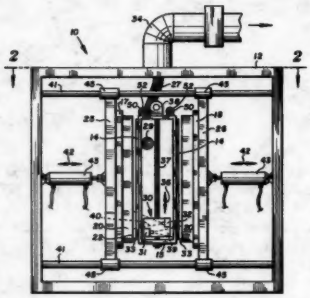
1. Apparatus for solvent bonding surfaces of thermoplastic materials, one to the other, which apparatus comprises:

(a) a solvent spray enclosure including work retaining rack means mounted therein and arranged to removably receive and retain pairs of workpieces in opposed relation to one another and exhaust means for exhausting gaseous vapor from said enclosure;

(b) mask means disposed within said solvent spray enclosure and arranged for masking selected surface portions of at least one pair of workpieces held within said work retain-

ing rack means, and means for controllably heating said mask means;

(c) solvent spray apparatus disposed within said solvent spray enclosure and including spray-head means having at least one spray nozzle operable relative to said mask means and said at least one pair of workpieces for generating a solvent spray mist therefrom and onto selected unmasked surface portions of said workpieces;



(d) first carriage means for transporting said solvent spray apparatus along an axis generally midway between said opposed pairs of workpieces for directing a substantially uniform application of solvent mist to the unmasked surface portions of said workpieces; and

(e) second carriage means for transporting said workpieces along a second axis generally normal to said first axis for holding said solvent exposed pairs of workpieces in face-to-face bonding relationship, one to the other.

4,595,447

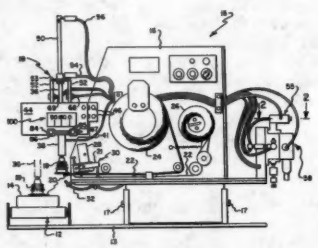
ARTICLE LABELING MACHINE

John W. Lindstrom, Newfield, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Dec. 10, 1984, Ser. No. 680,136

Int. Cl.[4] B65C *9/02, 9/36*

U.S. Cl. 156—364 **8 Claims**



1. A labeling machine of the type comprising in combination, a base support (16) and a high speed operating conveyor (12) adapted to carry a succession of articles (14) each of which is to be labeled as it arrives at a labeling station with an appropriately printed label (20) carrying previously ascertained marketing information(s) specifically applicable to each such article, said machine including a printed label dispenser means (30) located on said support to one side of and at an elevation above said conveyor for dispensing in sequence and in horizontally flat-wise attitude labels having pressure sensitive adhesive on one side and with appropriate marketing information(s) printed on the other side in a standard orientation readout relationship to the vertical axes of said labels; said machine having an improved carrying means for transferring such printed labels to such articles and applying them to the article to be labeled; said carrying means comprising:

label pickup means operable for temporary attachment to the first in line of said labels as presented by said dispenser means and for transporting said labels while in flat-wise attitude throughout a smoothly curving composite horizontally sidewise and vertically descending path, and then depositing said labels on said articles as they pass through said labeling station, whereafter said pickup means returns to said dispenser means while traveling in a similar diagonally curving path, said pickup means comprises a support plate (44) mounted on said base support (16) for horizontal sliding movements thereon; a vertically standing hollow tube (36) carried by said plate (44) in vertically slidable relation thereon; a vacuum shoe (19) at the base of said tube; means (60) for causing said support plate to reciprocate relative to said base support in horizontal directions; means (50) for causing said tube to reciprocate in vertical directions; means (58) for causing said tube to be displaced simultaneously laterally and vertically in smoothly curving arcuate paths between the positions of said dispenser means and the articles to be labeled; and a vacuum source connected into communication with the interior of said tube for holding said labels to said shoe during transports thereof.

4,595,448

TIRE BUILDING APPARATUS

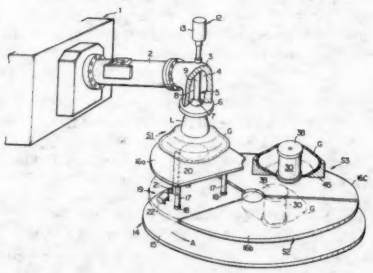
Michitoshi Sorioka, Higashiyamato, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,688

Claims priority, application Japan, Nov. 19, 1982, 57-203860

Int. Cl.[4] B29D *30/00*

U.S. Cl. 156—396 **8 Claims**



1. A tire building apparatus comprising:

an extruder having an extrusion die comprising a doughnut-shaped die member and an axially elongated die member to provide for consecutively extruding a cylindrical-shaped material downwardly from space between said doughnut-shaped die member and said axially elongated die member;

tire supporting means positioned under said extruder for supporting a green tire into which said cylindrical-shaped material is to be inserted, the supporting means being movable toward and away from said extruder and being revolvable in a horizontal plane with respect to said extruder;

expanding means mounted on said tire supporting means adapted to hold said cylindrical-shaped material from the inside of said green tire and to expand radially and outwardly said cylindrical-shaped material to bond to an inner surface of said green tire;

a severing assembly mounted on said tire supporting means for severing to a predetermined length said cylindrical-shaped material inserted into said green tire; and drive

means adapted to drive said tire supporting means to move with respect to said extruder.

4,595,449

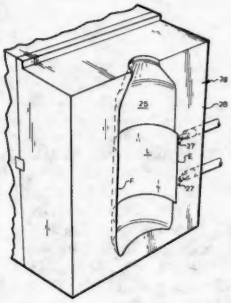
LABELS TO BLOW MOLDED ARTICLES

Casimir W. Nowicki, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 570,059, Jan. 12, 1984, abandoned. This application May 31, 1985, Ser. No. 739,837

Int. Cl.[4] B65C *9/28*; B32B *31/00*; B28B *21/36*; B29C *5/06*

U.S. Cl. 156—444 16 Claims



1. In an apparatus for forming and labeling a container which comprises means for blowing a parison outwardly into conformity with a cavity defined by a sectional mold, the apparatus further including

means for supporting a label in each section of the mold,

each label having a relative width circumferentially such that an edge thereof extends beyond the side edge of the cavity forming portion of the mold section,

and means for deflecting said edges which extend beyond the side edges as the sections of the mold close such that when the sections of the mold close, the deflected edges will be in underlying relationship with an adjacent edge of an adjacent label to form a continuous label about the container after the parison has been blown.

4,595,450

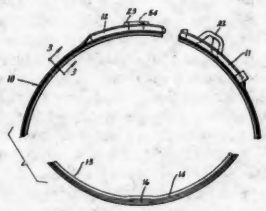
APPARATUS FOR MAKING A BRAKE-BAND

Ronald J. Pike, New Baltimore, Mich., assignor to D.A.B. Industries, Inc., Madison Heights, Mich.

Division of Ser. No. 544,605, Oct. 24, 1983, which is a continuation-in-part of Ser. No. 389,843, Jun. 18, 1982, abandoned. This application May 22, 1985, Ser. No. 736,865

Int. Cl.[4] B29C *53/00*, *55/00*

U.S. Cl. 156—500 7 Claims



1. A fixture for use in the manufacture of a friction band having a length of resinous plastic material with a plurality of elongated filaments embedded therein and extending lengthwise thereof and with lugs at the ends thereof for receiving an actuating force, said fixture comprising a cylindrical form about which said friction band is adapted to be wrapped, first means engageable with one of said lugs to locate the same in fixed position on said form, and second means engageable with the other lug and operative to apply a tangential force thereon in a direction to tension said band.

4,595,451

PROCESS AND APPARATUS FOR ETCHING PRINTED CIRCUIT BOARDS

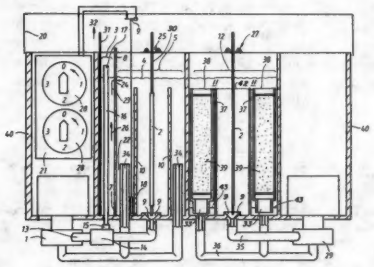
Walter Holzer, Drosteweg 19, Meersburg, Fed. Rep. of Germany (7758)

Filed Dec. 13, 1984, Ser. No. 681,382

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345050

Int. Cl.[4] C23F *1/00*; B44C *1/22*; C03C *15/00*, *25/06*

U.S. Cl. 156—627 25 Claims



1. In a process for etching a printed circuit board by immersion in an etching solution, the improvement comprising:

contacting in an etching zone said printed circuit board with a stream of etching solution in turbulent flow to effect etching of said printed circuit board; and

electrolyzing in an electrolyzing zone said etching solution whereby copper is plated out on an electrode, said etching zone being in fluid flow communication with said electrolyzing zone and wherein thermodynamic flow of liquid is enhanced by deposition of copper and generation of gases therein.

4,595,452

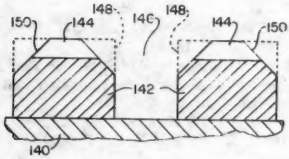
METHOD AND APPARATUS FOR PLASMA ETCHING

Richard F. Landau, Londonderry, and Henry A. Majewski, Nashua, both of N.H., assignors to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,618

Int. Cl.[4] B44C *1/22*; C03C *15/00*, *25/06*

U.S. Cl. 156—643 15 Claims



9. A method of conducting etching of a semiconductor workpiece so as to produce depressions that have chamfered corners, comprising the steps of:

(a) providing a semiconductor workpiece that has a mask on one side thereof defining at least one etching aperture;

(b) placing said workpiece between first and second electrodes disposed in a process chamber so that said work-

piece is proximate to said second electrode and said one side thereof faces said first electrode;

(c) coupling an RF power supply across said electrodes so as to create an RF electric field between said electrodes;

(d) selectively feeding a reactive etchant gas (1) through first gas feed means arranged to discharge said gas in a plurality of streams directed toward said second electrode perpendicularly to said one side of said workpiece; and

(e) selectively feeding a reactive etchant gas through a second gas feed means arranged to discharge said gas through second feed means arranged to discharge said gas in a plurality of streams directed toward said second electrode at an acute angle to said one side of said workpiece;

whereby the gas streams discharged from said first and second gas feed means are ionized and accelerated toward said second electrode so as to pass through said at least one etching aperture, with the gas streams from said first gas feed means passing through said at least one etching aperture substantially perpendicularly to said one side to cause formation of a depression in said workpiece having sharp outer corners, and the gas streams from said second gas feed means passing through said at least one etching aperture at an acute angle to said one side to cause chamfering of said outer corners.

4,595,453

METHOD FOR ETCHING A SEMICONDUCTOR SUBSTRATE OR LAYER

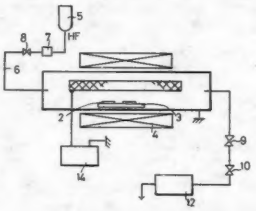
Shunpei Yamazaki, and Toshiji Hamatani, both of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,859

Claims priority, application Japan, Sep. 22, 1983, 58-175686

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **6 Claims**



1. A method for etching a semiconductor substrate or layer formed principally of silicon or silicon carbide through the use of a reactive gas plasma, wherein said reactive gas plasma is a hydrogen fluoride gas plasma from which oxygen and oxides have been removed.

4,595,454

FABRICATION OF GROOVED SEMICONDUCTOR DEVICES

William C. Dautremont-Smith, Westfield, and Daniel P. Wilt, Scotch Plains, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 15, 1984, Ser. No. 621,080

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

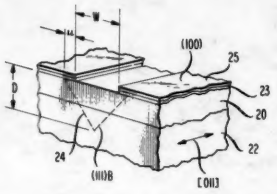
U.S. Cl. 156—647 **14 Claims**

1. A method of fabricating a device, which includes etching a groove in a surface of a body of a Group III-V compound semiconductor material, comprising the steps of:

(a) forming a thin native oxide layer on said surface, said oxide layer being soluble in the etchant used to form said groove,

(b) forming on said oxide layer a dielectric layer which is essentially impervious to said etchant,

(c) patterning said dielectric layer to form openings therein, and



(d) exposing said body and said layers to said etchant to form said groove.

4,595,455

METHOD FOR CONTROLLING BATCH ALKALINE PULP DIGESTION IN COMBINATION WITH CONTINUOUS ALKALINE OXYGEN DELIGNIFICATION

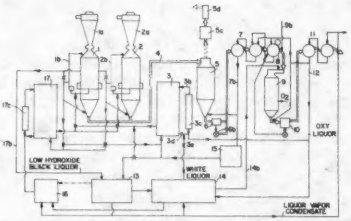
Nils V. Mannbro, Asarum, Sweden, assignor to Mannbro Systems Handelsbolag, Karlshamn, Sweden

Continuation of Ser. No. 69,184, Aug. 23, 1979, abandoned, which is a continuation of Ser. No. 890,483, Mar. 27, 1978, abandoned, which is a continuation of Ser. No. 736,886, Oct. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 523,873, Nov. 14, 1974, abandoned. This application Sep. 4, 1981, Ser. No. 299,564

Claims priority, application Sweden, Nov. 23, 1973, 7315894

Int. Cl.[4] D21C *7/12, 9/147, 11/00*

U.S. Cl. 162—38 **7 Claims**



1. In a method for batch pulp digestion of lignocellulose material with a hydroxide-bearing cooking liquid, in combination with continuous alkaline oxygen delignification comprising an oxygen-alkali process in subsequent pulp bleaching in a sequence of one or several steps, from which oxygen-alkali waste liquor having sodium compounds worth recovering and dissolved combustible lignin products is recovered via a brown stock washing step in such a way that oxygen-alkali waste liquor joins black liquor which is obtained by pulping of the material to a predetermined Kappa number, said pulping being controlled in part by the chemical charge to a predetermined hydroxide concentration in the cooking liquor and in part by the H-factor so that the subsequent oxygen delignification comprising said oxygen-alkali process can take place with small cellulose degradation and to the greatest extent constant composition of the recovered oxygen-alkali waste liquor comprising said oxygen-alkali waste liquor, pulping the lignocellulose material in a plurality of intermittent digesters using the hydroxide-bearing cooking liquor containing oxygen-consuming substances to produce brown stock, batchwise removing raw brown stock from said digesters, washing said raw brown stock with waste liquor from the oxygen-alkali process, contacting said washed brown stock with oxygen to effect oxygen delignification of said brown stock thereby to produce oxygen-

alkali bleached pulp, removing oxygen-alkali waste liquor from said bleached pulp, using a first portion of the last-named waste liquor as said waste liquor in said raw brown stock washing step, removing a first portion of spent black liquor containing oxygen-consuming substances from said digesters and regenerating the same to produce hydroxide-bearing white liquor, feeding a second portion of said spent black liquor to a cooking liquor accumulator common to said plural digesters, feeding a second portion of said oxygen-alkali waste liquor to said cooking liquor accumulator, feeding a portion of said white liquor to said cooking liquor accumulator, measuring the hydroxide concentration by continuous analysis of said cooking liquor of said accumulator, and controlling the dosage of said white liquor to said accumulator in response to said hydroxide concentration measurement so as to maintain the hydroxide concentration of said cooking liquor substantially constant and to maintain a low value of the ratio

oxygen-consuming substances/hydroxide

in said cooking liquor; the improvement comprising removing the raw brown stock from said digesters by blowing whereby the raw brown stock is conveyed by blow liquor, feeding a portion of said blow liquor continuously to said cooking liquor accumulator, feeding cooking liquor from said cooking liquor accumulator to said digesters as said cooking liquor in said digesting step, and conveying from said digesting step each removed batch of raw brown stock and cooking liquor by the blow liquor whereof a residue is occluded with the feed of said washed brown stock to said oxygen-alkali delignification process.

4,595,456

PULP WASHING PROCESS

Alf O. Andersson, 38 Kofallsvägen, S-710 40 Frövi, Sweden

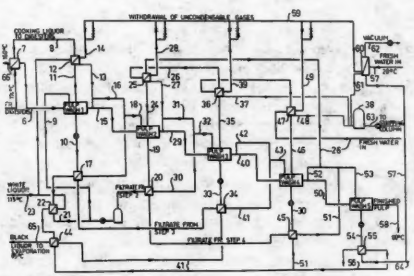
PCT No. PCT/SE84/00132, § 371 Date Nov. 20, 1984, § 102(e) Date Nov. 20, 1984, PCT Pub. No. WO84/04114, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 13, 1983, Ser. No. 680,335

Claims priority, application Sweden, Apr. 13, 1983, 8302047

Int. Cl.[4] D21C *11/06*

U.S. Cl. 162—47 **4 Claims**



1. A process for washing pulp coming from a digesting stage in a plurality of steps at a pressure above atmospheric in at least one of the steps and wherein washing filtrate from a subsequent step or fresh water is used as a washing liquid in a given step, comprising:

subjecting the pulp to a plurality of successive washing steps from a first to a last step;

heat exchanging outgoing washing filtrate from each washing step prior to said last washing step with washing liquid going into a subsequent washing step;

heat exchanging a part of a filtrate from a second washing step with a filtrate coming from said first washing step;

combining said part of the filtrate from said second washing step with a cooking liquid conveyed to a digestion processing stage;

supplying fresh water as a diluting and washing liquid in a next to a last step and said last step;

heating exchanging said fresh water with said washing filtrate from said first washing step and a washing filtrate from said last washing step;

heating exchanging gases leaving each washing step subsequent to said first washing step with said fresh water;

subsequently using said fresh water heat exchanged with said gases as a diluting and washing liquid in the last step, wherein condensates and uncondensably gaseous fractions are formed from said gases subsequent to heat exchanging with said fresh water;

combining said condensates with a diluting liquid used in each washing step prior to said next to last washing step;

heat exchanging said uncondensable gaseous fractions with said fresh water; and

heat exchanging said cooking liquor with incoming pulp to said first washing step.

4,595,457

OIL-IMPREGNATABLE INSULATING BOARD

Ryota Nishiyama; Masahiro Amano; Shunji Seino, all of Tokyo; Yutaka Gamou, and Hidenori Kawakami, both of Amagasaki, all of Japan, assignors to Mitsubishi Paper Mills, Ltd. and Mitsubishi Electric Corp., both of Tokyo, Japan

Continuation of Ser. No. 895,014, Apr. 10, 1978, abandoned. This application Apr. 27, 1981, Ser. No. 257,623

Claims priority, application Japan, Sep. 8, 1977, 52-108113

Int. Cl.[4] D21H *1/02*

U.S. Cl. 162—123 **7 Claims**

1. A method of producing an oil-impregnatable insulating board characterized in that an aqueous slurry consisting of water and fibrous particles of a heat-resistant aromatic polymer and short fibers made from said polymer or insulating inorganic short fibers or a mixture thereof is subjected to a paper making process to form a wet web and, after adjusting the water content to 50 to 95% weight %, said wet web is laid up in a desired number of layers and then the laminate is dewatered and dried for integration under pressure of 10 to 60 kg/cm^2 at a temperature not exceeding the softening point of said aromatic polymer of between 100° to 200° C. the content of the fibrous particles in the mixture of the fibrous particles and inorganic short fibers or short fibers made from an aromatic polymer is 20 to 95% by weight.

4,595,458

PROCESS FOR USING SELECTED FATTY ACID ADDUCTS OF A 1,2,4-TRIAZOLE AS SIZING OR WATERPROOFING AGENTS FOR CELLULOSIC MATERIALS

Richard L. Frentzel, Guilford, and Michael L. Rosin, Madison, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

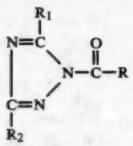
Filed May 17, 1985, Ser. No. 734,990

Int. Cl.[4] D21H *3/12*

U.S. Cl. 162—158 **15 Claims**

1. A process for treating a cellulosic material selected from the group consisting of cellulose, regenerated cellulose, and mixtures thereof, comprising the steps of:

contacting the cellulosic material with a dispersion comprising an effective sizing or waterproofing amount of a fatty acid adduct of a 1,2,4-triazole having the formula:



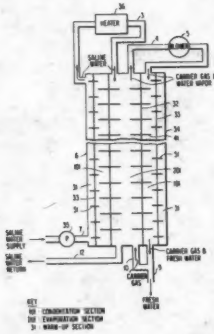
wherein R is an alkyl or alkenyl group having about 11 to about 21 carbon atoms and wherein R_1 and R_2 are individually selected from hydrogen or a lower alkyl group having 1 to 4 carbon atoms.

4,595,459

DESALINIZATION APPARATUS

Hideaki Kusakawa, and Junjiro Kai, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1982, Ser. No. 441,002
Int. Cl.[4] B01D *3/34;* C02F *1/04*
U.S. Cl. 202—177 8 Claims



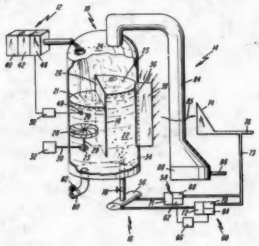
1. A desalinization apparatus, comprising; a section for elevating the temperature of saline water, a section for heating the saline water that has passed through said temperature elevating section, a section for evaporating the saline water that has passed through said heating section, a section for condensing water vapor, first means for directing the water vapor in said evaporation section to said condensation section together with a carrier gas, second means for directing the carrier gas to said evaporation section after the condensation of water vapor in said condensation section, and means for transferring the heat generated by the condensation of water from said condensation section to at least said evaporation section, wherein the condensation section is separated from the evaporation section by a partition, and the condensation section is also separated from the temperature elevating section by a partition, the heat generated in said condensation section by condensation of water vapor being transferred from said condensation section to said evaporation section and said temperature elevating section through said partitions, and wherein said evaporation, condensation and temperature elevating sections are arranged concentrically with the evaporation section located in the interior, the condensation section located exterior to and around said evaporation section and said temperature elevating section located exterior to and around said condensation section.

4,595,460

METHOD AND APPARATUS FOR WATER DISTILLATION WITH ENERGY RECOVERY

Charles F. Hurt, Rte. 5, Box 200, Bedford, Va. 25423

Filed Sep. 12, 1983, Ser. No. 531,289
Int. Cl.[4] B01D *3/34;* C02F *1/04*
U.S. Cl. 203—21 36 Claims



1. Apparatus for distilling a liquid supplied thereto comprising:

(a) first column forming means for forming a first column of the liquid having a first liquid level and receiving the supplied liquid therein,

(b) a second column forming means for forming a second column of the liquid having a second liquid level,

(c) level changing means for providing a differential between the liquid levels of said first and second columns and further for causing said second liquid level to be higher than said first liquid level,

said level changing means comprising aerating means for supplying a gas to one of said first and second columns for aerating the liquid therein,

(d) first connecting means for connecting bottom portions of said first and second columns,

(e) condensing means for condensing liquid vapor generated in said second column and for providing a distillate thereof,

(f) second connecting means for connecting top portions of said first and second columns and for returning unevaporated liquid from said second column to said first column,

(g) said second column forming means including an aeration tank for aerating the liquid therein,

(h) said aerating means of said level changing means comprising supply means for supplying the gas to said second column and for aerating the liquid therein,

(i) pressurizing means for pressurizing the gas supplied by said supply means,

(j) said pressurizing means comprising gas pumping means comprising compressor means and blower means for rapidly pressurizing gas in a storage tank and for maintaining pressure within said storage tank, respectively, and

(k) each of said compressor means and said blower means comprising driving motor means and heat exchange means for heating the gas by waste heat of said driving motor means.

19. A method for distilling a liquid comprising the steps of:

(a) supplying the liquid to a first conduit having a vertica. displacement between its two ends;

(b) providing the liquid from the lower one of the two ends of said conduit to a lower one of two ends in a second conduit having a vertical displacement between its two ends;

(c) causing the liquid in said second conduit to rise to a level higher than the liquid in said first conduit by aerating the liquid in said second conduit with a pressurized gas;

heating the gas with waste heat of a motor used for pressurizing the gas;

(d) evaporating and condensing a portion of the liquid in said second conduit to obtain a distillate thereof, and

(e) returning unevaporated liquid from the high level of said second conduit to said first conduit.

4,595,461
PROCESS FOR THE NON-DEGENERATIVE DISTILLATION OF FATTY ACIDS

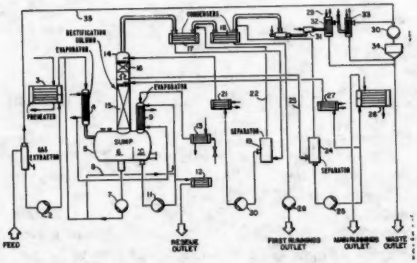
Lutz Jeromin, Hilden; Wilhelm Johannisbauer, Erkrath; Klaus Thorausch, Duesseldorf, all of Fed. Rep. of Germany; Franjo Skrapac, Perth, Australia; Helmiit Hartmann, Langenfeld, Fed. Rep. of Germany; Karl Hentschel, Duesseldorf, Fed. Rep. of Germany, and Otto Michel, Langenfeld, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,089

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322535

Int. Cl.[4] B01D *1/22, 3/38;* **C11C** *1/08*

U.S. Cl. 203—72 **8 Claims**



1. In a process for the non-degenerative distillation of C_{6-24}-fatty acids which are obtained by hydrolytically splitting natural fats and oils or by synthetic processes, removing water by thermally drying the crude product under reduced pressure, subjecting the dried and heated crude product to fractional evaporation in falling-film evaporators, in the presence of 0 to 10% by weight of the total feed of superheated steam, and condensing the resulting various vapor fractions in at least two condensers, the improvement comprising:

(a) conducting the thermal drying process at a temperature of 60° to 80° C. under a pressure of from 90 to 100 mbars;

(b) heating the dried crude product in a first falling-film evaporator to a temperature of 212° to 224° C. under a pressure of 5 to 20 mbars to evaporate the low-boiling fraction of said dried crude product, leaving a liquid residue;

(c) distilling said liquid residue, with recirculation distillation, to completion;

(d) passing the vapors from said distillation through a rectification column having baffles which show a pressure loss of at most 1 mbar per meter of packing height at a comparable air flow velocity of at least 2 m/s, said column comprising an upper separation stage having at least one separation sub-stage and a lower separation stage having at least three separation sub-stages, condensing the low-boiling constituents of said vapors in said upper stage as main runnings;

(e) condensing the remaining vapors in two sequential outlet condensers;

(f) returning the condensate from the first said outlet condenser to the head of the rectification column;

(g) drawing off said main runnings through an outlet as a sidestream from said rectification column;

(h) returning a partial return flow from a sidestream beneath said outlet for the main runnings; and

(i) continuously removing a small quantity of residue from a second, circulation-type falling-film evaporator.

4,595,462
METHOD FOR DETERMINING CURRENT EFFICIENCY IN GALVANIC BATHS

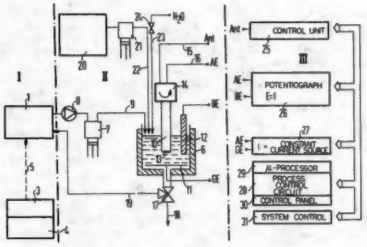
Frank Vangaever, and Jacky Vanhumbeeck, both of Brugge, Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 16, 1981, Ser. No. 284,100

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030664

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T **18 Claims**



1. A method for determining current efficiency in a galvanic bath, comprising the steps of: taking an electrolyte solution bath sample from the galvanic bath; providing a measuring cell for receiving the bath sample and precipitating in the cell metal from said sample onto a rotating disc electrode in the measuring cell to which a negative DC voltage is applied at a constant current i_k during a first predetermined time t_k; emptying the measuring cell; introducing a different electrolyte solution into the measuring cell; anodically eroding the precipitated layer from the rotating disc electrode by use of the different electrolyte solution upon pole-reversal of the DC voltage at a constant current i_a during a second time t_a; and calculating current efficiency N_k according to the equation

$$N_k = \frac{i_a \times t_a \times N_a}{i_k \times t_k}$$

where N_a is a current efficiency of the anodic erosion, and where t_a is the time required for the anodic erosion of the precipitated metal.

4,595,463
COBALT TREATMENT OF NICKEL COMPOSITE ELECTRODE SURFACES

Woodrow W. Lee, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1985, Ser. No. 740,114

Int. Cl.[4] H01M *10/44*

U.S. Cl. 204—2.1 **12 Claims**

1. A process of treating a nickel active material/sintered nickel coated graphite fiber grid composite electrode comprising:

(1) soaking a nickel composite electrode comprising

(a) a grid of sintered nickel-coated graphite fibers wherein the grid has pores of an average effective diameter of from 50 to 60 microns, and

(b) an nickel active material selected from the group consisting of nickel oxide, nickel hydroxide, and mixtures thereof which is contained in the pores of the grid in a cobalt solution select from the group consisting of

(a) from 0.01 to 3.5M cobalt nitrate,

(b) from 0.01 to 1.0M cobalt sulfate

(c) from 0.01 to 1.0M cobalt chloride, and

(d) from 0.01 to 2.0M cobalt acetate in a solvent selected

from the group consisting of (i) water and (ii) a mixture of water and from more than zero to 50 volume percent of an alcohol selected from the group consisting of methanol, ethanol, n-propanol, and mixtures thereof; and

(2) applying a cathodic current having a density of from about 10 to about 200 mA/cm^2 across the nickel composite electrode for from 5 to 600 seconds while the electrode is in the cobalt solution.

4,595,464

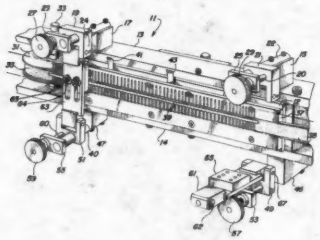
CONTINUOUS CONTACT METHOD FOR ELECTROLYTIC FLUID WORKING OF PARTS

Jeffery E. Bacon, Long Beach; James E. Craig, South Pasadena, and Mark K. Pedersen, Yorba Linda, all of Calif., assignors to Robbins & Craig Welding & Mfg. Co., South El Monte, Calif.

Division of Ser. No. 654,760, Sep. 25, 1984, abandoned. This application Jul. 22, 1985, Ser. No. 757,364

Int. Cl.^{4} C25D *5/02, 7/06*

U.S. Cl. 204—15 **7 Claims**



1. A method of continuously electrolytically working a discrete area on a plurality of aligned parts, comprising the steps of:

maintaining the parts to be worked in a proximately aligned position;

causing electrolyte solution to continuously flow from a contained supply in close proximity to and on one side of a fluid-absorbent belt, into the belt;

continuously moving said fluid-absorbent belt; and

moving the parts along the length of the belt into contact with portions thereof at the areas on the parts to be worked.

4,595,465

MEANS AND METHOD FOR REDUCING CARBN DIOXIDE TO PROVIDE AN OXALATE PRODUCT

Peter G. P. Ang; Anthony F. Sammells, both of Naperville, Ill., and Abraham Morduchowitz, Monsey, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,161

Int. Cl.^{4} C25B *3/04*

U.S. Cl. 204—59 R **24 Claims**

1. A process for reducing carbon dioxide in the presence of a metal element to provide a metallic oxalate comprising the steps of:

providing a R_{II}/O_{II} redox couple electrolyte solution,

providing a R_I/O_I redox couple electrolyte solution,

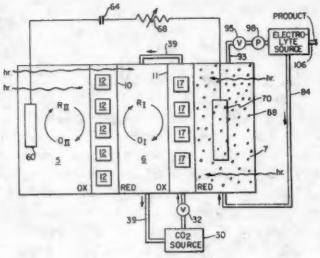
separating R_{II}/O_{II} solution from the R_I/O_I *from the* R_I/O_I with a first membrane having photosensitizers,

providing carbon dioxide to a second membrane contiguous to the R_I/O_I solution and having photosensitizers and a catalyst,

providing a slurry of a metal element solvent and salt in a manner so that some of the slurry is in contact with the second membrane,

illuminating both membranes,

providing an electrical voltage across the R_{II}/O_{II} and R_I/O_I electrolyte solution and the electrolyte slurry in a manner so that there is one electrode in the R_{II}/O_{II} electrolyte solution and another electrode in the electrolyte



slurry so as to cause a reaction between the carbon dioxide at the second membrane and the electrolyte slurry to produce the metallic oxalate.

4,595,466

METAL ELECTROLYSIS USING A LOW TEMPERATURE BATH

Jack Y. Josefowicz, Westlake Village, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 7, 1985, Ser. No. 709,466

Int. Cl.^{4} C25C *3/04, 3/06*

U.S. Cl. 204—67 **11 Claims**

1. A method of producing a metal selected from a group consisting of aluminum and magnesium comprising the steps of:

Providing an electrolyte cell including an electrolyte comprising from 85 to 90 percent by weight lithium chloride and 10 to 15 percent by weight sodium fluoride; and having a substantial absence of a salt of said metal;

a cathode immersed in said electrolyte for electrolytic winning of said metal; and

an anode comprising a mixture of an oxygen-containing compound of said metal and a reducing agent; and

operating said cell to produce said metal deposited in a molten pool in said cell.

4,595,467

PROCESS FOR PREPARATION OF GLYOXYLIC ACID THROUGH ELECTROCHEMICAL ANODIC OXIDATION OF GLYOXAL

Gérard Pierre, Eybans; Mokhlis E. Kordi, and Georges Cauquis, both of Grenoble, all of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Jul. 29, 1985, Ser. No. 759,886

Claims priority, application France, Sep. 4, 1984, 84 13607; Nov. 28, 1984, 84 18117

Int. Cl.^{4} C25B *3/02*

U.S. Cl. 204—79 **6 Claims**

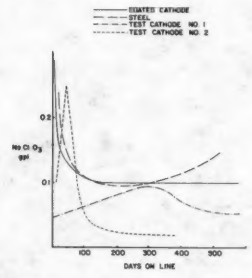
1. In a process for preparation of glyoxylic acid by electrochemical oxidation of glyoxyal in aqueous solution, at a temperature comprised between 0° C. and 70° C., in an electrolyzer comprising at least one cathodic compartment containing a cathode and a catholyte, at least one anodic compartment containing an anode and an anolyte consisting of an aqueous solution of glyoxal and an electrolyte and at least one separator between both of these compartments, the improvement wherein said anode is doped by metallic adatoms selected from the group comprising silver, bismuth, copper, tin and thallium.

4,595,468

CATHODE FOR ELECTROLYSIS CELL

James R. Brannan, Perry, Ohio, assignor to Eltech Systems Corporation, Boca Raton, Fla.

Filed Jul. 19, 1984, Ser. No. 632,227
Int. Cl.[4] C25B *1/16;* B05D *3/10*
U.S. Cl. 204—98 **13 Claims**



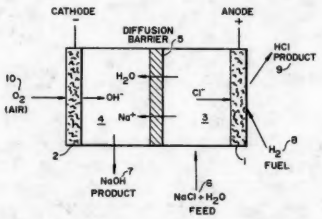
12. A method of producing chlorine and caustic soda while hindering the formation of by-product sodium chlorate, which comprises passing electrolysis current through brine between an anode and a cathode having a catalytic coating of porous metal including at least one of nickel, iron and cobalt, said cathode having been preconditioned prior to placing it into initial electrolysis service by depositing within said porous metal coating a chlorate suppressor solid compound of iron as it is formed by an in situ chemical reaction between solutions.

4,595,469

ELECTROLYTIC PROCESS FOR PRODUCTION OF GASEOUS HYDROGEN CHLORIDE AND AQUEOUS ALKALI METAL HYDROXIDE

Peter C. Foller, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 499,134, May 31, 1983, abandoned.
This application Feb. 5, 1985, Ser. No. 698,302
Int. Cl.[4] C25B *1/16, 1/22*
U.S. Cl. 204—98 **12 Claims**



1. A continuous process for the production of gaseous hydrogen chloride and aqueous alkali metal hydroxide in an electrolytic cell containing an anode, cathode, anolyte, catholyte, anolyte compartment, catholyte compartment and a diffusion barrier separating said anolyte and catholyte compartments, said barrier being selectively permeable to water and alkali metal ions and said anode being a gas diffusion anode having a liquid side in contact with said anolyte and a gaseous side opposite said liquid side, which process comprises the steps of:

(a) feeding an aqueous alkali metal chloride solution as anolyte into said anolyte compartment;

(b) feeding a hydrogen-containing gas to the gaseous side of said gas diffusion anode;

(c) maintaining an electrical potential between said cathode and anode whereby;

(1) alkali metal ions and water pass from the anolyte through the diffusion barrier into the catholyte;

(2) hydroxy ions are formed at said cathode which react with said alkali metal ions forming alkali metal hydroxide in said catholyte; and

(3) hydrogen is oxidized at said anode and reacts with chloride ions producing hydrogen chloride;

(d) withdrawing catholyte from said catholyte compartment, said catholyte comprising an aqueous solution of alkali metal hydroxide;

(e) maintaining the pressure on the gaseous side of said anode such that at least 50% by weight of said hydrogen chloride produced at said anode escapes said anode via the gaseous side of said anode as gaseous hydrogen chloride; and

(f) withdrawing from the gaseous side of said anode gaseous hydrogen chloride, said gaseous hydrogen chloride comprising at least 50% by weight of the total quantity of hydrogen chloride produced at said anode.

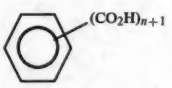
4,595,470

PROCESS FOR THE PREPARATION OF BENZENE POLYCARBOXYLIC ACIDS

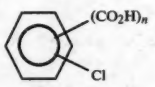
Nobuyuki Sugita, 3-4, Senmanda-cho, Shugakuin, Sakyo-ku, Kyoto-shi, Kyoto-fu, 606; Kiyoshi Kudo, 16, Nishikawa-cho, Nishikyogoku, Ukyo-ku, Kyoto-shi, Kyoto-fu, 615, and Koichi Nagaoka, 3-58-30, Mutsukawa, Minami-ku, Yokohama-shi, Kanagawa-ken 232, all of Japan

PCT No. PCT/JP84/00600, § 371 Date Aug. 15, 1985, § 102(e) Date Aug. 15, 1985
PCT Filed Dec. 14, 1984, Ser. No. 768,091
Claims priority, application Japan, Dec. 15, 1983, 58-236888
Int. Cl.[4] B01J *19/12*
U.S. Cl. 204—157.87 **4 Claims**

1. A process for the preparation of a benzene polycarboxylic acid represented by the formula:



wherein n is an integer of 2 or 3, which comprises reacting a monochlorobenzene polycarboxylic acid represented by the formula:



wherein n is as hereinbefore defined, or an alkali metal salt thereof which carbon monoxide in an aqueous solution of an alkali metal compound in the presence of a carbonylation catalyst with irradiation of ray of 340–400 nm, and then acidifying the resultant reaction solution.

4,595,471
ORGANOPOLYSILOXANE COMPOSITIONS CROSSLINKABLE BY ULTRAVIOLET LIGHT AND A PROCESS FOR ENCAPSULATING ELECTRONIC COMPONENTS

Gerhard Preiner, Burghausen, and Klaus Matejcek, Munich, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 6, 1985, Ser. No. 762,756

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433654

Int. Cl.[4] C08F *2/46*

U.S. Cl. 522—29 **15 Claims**

1. An organopolysiloxane composition crosslinkable by ultraviolet light comprising (A) an organopolysiloxane having units of the formula

$$HR^1C{=}CR^2COOR^3SiR_2O_{\frac{1}{2}},$$

where R is selected from the group consisting of a monovalent hydrocarbon radical and a halogenated monovalent hydrocarbon radical, R^1 is selected from hydrogen and a halogenated phenyl radical, R^2 is selected from the group consisting of hydrogen and an alkyl radical having from 1 to 4 carbon atoms per radical, and R^3 is selected from the group consisting of a divalent hydrocarbon radical and a halogenated divalent hydrocarbon radical in which two such siloxane units are present per molecule and at least 80 percent of the number of the remaining siloxane units in organopolysiloxane (A) comprise units of the formula

$$R_2SiO,$$

where R is the same as above, in which organopolysiloxane (A) has an average viscosity of from 20 to 5000 mPa.s at 25° C., (B) an organopolysiloxane having terminal units of the formula $R_3SiO_{\frac{1}{2}}$, where R is the same as above and has from 0.05 to 5 mole percent of units of the formula

$$HSR^3R_aSiO_{\frac{3-a}{2}},$$

where R and R^3 are the same as above, and a is 0 or 1, and up to at least 99 mole percent of the remaining siloxane units, other than the triorganosiloxy groups, comprise units of the formula

$$R_2SiO,$$

where R is the same as above, in which organopolysiloxane (B) has an average viscosity of from 50 to 2000 mPa.s at 25° C., and (C) a photosensitizer, in which Si-bonded hydroxy groups that are present in units of the formula

$$R_2SiO$$

are present in an amount which does not exceed 0.2 hydroxy groups per group of the formula

$$HR^1C{=}CR^2COOR^3{-},$$

and a total of at most 0.02 percent by weight, based on the total weight of the organopolysiloxane (A), organopolysloxane (B) and photosensitizer (C), of organic titanium or organic tin compounds are present in the composition.

4,595,472
SILICON CARBIDE PRECERAMIC VINYL-CONTAINING POLYMERS

Loren A. Haluska, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 647,329, Sep. 4, 1984, Pat. No. 4,546,163. This application Jul. 8, 1985, Ser. No. 742,348

Int. Cl.[4] C08F *2/46*

U.S. Cl. 522—99 **38 Claims**

1. A method of preparing a silicon carbide-containing ceramic article, said method comprising (A) forming an article of the desired shape from a polysilane of the average formula

$$[R_2Si][RSi][R_d'(CH_2{=}CH)Si]$$

in which polysilane there is from 0 to 60 mole percent $[R_2Si]$ units, 30 to 99.5 mole percent [RSi] units and 0.5 to 15 mole percent $[R_d'(CH_2{=}CH)Si]$ units, where the remaining bonds on silicon are attached to other silicon atoms and alkyl radicals of 1 to 4 carbon atoms, vinyl radicals or phenyl radicals wherein R is an alkyl radical containing 1 to 4 carbon atoms, R' is an alkyl radical containing 1 to 4 carbon atoms, a vinyl radical, or a phenyl radical, and d is 1 or 2; and (B) heating the article formed in (A) in an inert atmosphere or in a vacuum to an elevated temperature greater than 800° C. until the polysilane is converted to silicon carbide-containing ceramic articles.

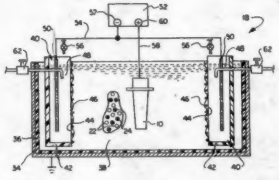
4,595,473
FORGING LUBRICANT

Thomas G. Kalamasz, Mentor, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 28, 1984, Ser. No. 645,089

Int. Cl.[4] C25D *13/02*

U.S. Cl. 204—181.1 **7 Claims**

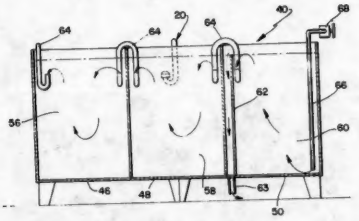


1. A method comprising the steps of electrophoretically coating a workpiece with first glass particles which transform from a solid to a liquid at a first temperature and second glass particles which transform from a solid to a liquid at a second temperature which is higher than the first temperature, heating the coated workpiece, to a first temperature, forming a non-lubricative oxidation barrier over the outside of the workpiece at said first temperature that is below said second temperature by transforming the first glass particles to a liquid at said first temperature while said second glass particles remain in solid form, continuing the heating of the workpiece to said second temperature and transforming the second glass particles from a solid to a liquid at the second temperature said first and second glass particles being combined at said second temperature to form a glass lubricant having a viscosity distinct from the viscosities of either of said first or second glass compositions and sufficient to function as a hydrodynamic lubricant on forging the workpiece while it is covered with the combined glass lubricant.

4,595,474
ELECTROPLATING SOLUTION RECOVERY SYSTEM

Ralph C. Greco, Warwick, R.I., assignor to Greco Bros., Inc., Providence, R.I.

Filed Nov. 14, 1983, Ser. No. 551,556
Int. Cl.[4] C25D *21/20, 17/02;* B01D *21/24*
U.S. Cl. 204—232 1 Claim



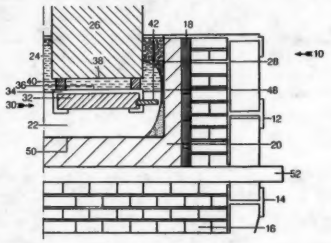
1. An electroplating solution recovery system comprising:
(a) an electroplating tank containing an electroplating solution;
(b) a plurality of rinse tanks containing rinse solutions, said rinse tanks being disposed at substantially the same vertical height as said plating tank and defining a sequential series of adjacent rinse tanks, the first rinse tank in said series being adjacent said plating tank;
(c) a plurality of tubular interconnections interconnecting sequential rinse tanks in said series to each other and also interconnecting the first rinse tank in said series to said plating tank, opposite ends of said interconnections being disposed in the solutions in the respective tanks thereby interconnected so that as plating solution is dissipated from the electroplating tank it is replenished with rinse solution from the first rinse tank, and as the rinse solutions are dissipated from the rinse tanks, except the last rinse tank in the series, they are replenished with rinse solutions from the respective next sequential rinse tanks in the series;
(d) means for supplying water to the last rinse tank in said series to replenish the level of rinse solution therein, said water being supplied at a rate which is greater than the rate of flow of rinse solution from said last tank to the next to the last tank in said series;
(e) overflow means in said last tank for withdrawing rinse solution therefrom and for removing said withdrawn rinse solution from said system, said overflow means defining the maximum solution level in said last tank and cooperating with said tubular interconnections for defining the solution levels in the rinse tanks other than said last tank and also the solution level in the plating tank.

4,595,475
SOLID CATHODE IN A FUSED SALT REDUCTION CELL

Rudolf Pawlek, and Hans-Anton Meier, both of Sierre, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 30, 1983, Ser. No. 509,402
Claims priority, application Switzerland, Jul. 9, 1982, 4202/82
Int. Cl.[4] C25C *3/08;* C25B *11/03, 11/12, 13/00*
U.S. Cl. 204—243 R 17 Claims

1. Exchangeable solid cathode in a cell in particular for the fused salt electrolytic production of aluminum, wherein said cell includes at least an anode, cathode and electrolyte, the improvement which comprising: providing that said anode and cathode have respective work faces facing each other, wherein at least the work face of said cathode is of a wettable material and said cathode has an average density below that of the molten aluminum so that said cathode floats and projects into the electrolyte from below, at least two electrically insulating spacer means attached to the work face of the cathode, said spacer means being pressed against the work face of the related anode due to the upthrust on the cathode and side stabilizing



means affixed to said cathode which provide for the lateral positioning of the cathode.

4,595,476
ION EXCHANGE MEMBRANES PRE-EXPANDED WITH DI- AND POLY ETHER-GLYCOLS

Thomas C. Bissot, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 26, 1984, Ser. No. 634,779
Int. Cl.[4] C25B *9/00, 13/00;* C08D *5/20*
U.S. Cl. 204—252 28 Claims

1. An optionally reinforced, pre-expanded cation-exchange membrane comprising one or more layers of fluorinated polymer whose functional groups are selected from $—CO_2M$ and $—SO_3M$ where M is H, Na or K, and which membrane contains about 8 to 30% by weight of a swelling agent consisting of a compound or mixture of compounds of the formula

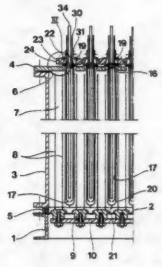
$$HO(CH_2CHYO)_nH$$

where
Y=H or CH_3
and n=2, 3 or 4.

4,595,477
ELECTROLYSIS CELL

Jean-Paul Detournay, Franiere, and Emile Cabaraux, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Aug. 3, 1984, Ser. No. 637,415
Claims priority, application Luxembourg, Aug. 18, 1983, 84973
Int. Cl.[4] C25B *9/00, 11/02, 13/02, 15/08*
U.S. Cl. 204—253 12 Claims



11. An electrolysis cell comprising an enclosure having a wall with a plurality of openings, a plurality of electrodes in said enclosure, each of said electrodes being in line with a respective one of said openings, a rigid bar attached to each of said electrodes and received in each respective one of said

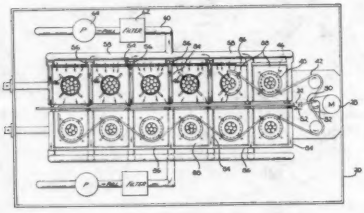
openings, a tubular separator surrounding each of said electrodes, said separator being in the form of a bag which wholly encloses the portion of the respective electrode that is in said enclosure and having an open end portion to receive said electrode, said open end portion being disposed in said respective opening and surrounding said rigid bar and sealing means for providing a leaktight seal between said end portion of said separator and said rigid bar and between said end portion of said separator and a portion of said wall surrounding said respective opening.

4,595,478

TURBULENT CELL ELECTROPLATING METHOD AND APPARATUS

Peter P. Pellegrino, 216 Edgewood La., Apple Valley, Minn. 55124, and Damian Pellegrino, 17029 Harbor Bluff Cir., Huntington Beach, Calif. 92649

Filed Nov. 23, 1984, Ser. No. 674,426
Int. Cl.[4] C25D *17/00*
U.S. Cl. 204—273 **16 Claims**



1. Apparatus for plating the surface of an article comprising
a container for confining a plating solution;
support means for supporting the article to be plated;
a plurality of agitator means within said container and beneath the level of plating solution therein for mechanically providing substantial agitation to the plating solution, said agitator means being disposed adjacent the surfaces of the article to be plated;
manifold means extending between said agitator means to positions adjacent to the surface of the article to be plated for withdrawing plating solution from regions adjacent the surface of the article to be plated; and
pump means for causing plating solution to be withdrawn through said manifold means for redelivery to said container.

4,595,479

MODIFIED ELECTRODE

Yasuhiro Kimura, Kawasaki, and Katsumi Niki, Yokohama, both of Japan, assignors to Ajinomoto Co., Inc., Yokohama, Japan

Filed Oct. 19, 1983, Ser. No. 543,295
Claims priority, application Japan, Nov. 9, 1982, 57-196608; Jul. 21, 1983, 58-133103
Int. Cl.[4] C25B *11/12*
U.S. Cl. 204—294 **5 Claims**

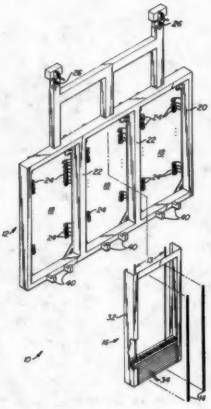
3. The electrode of claim 1, wherein the said redox/adsorption mediator is at least one member selected from the group consisting of viologen dye, bipyridine, phenanthroline, 1-methoxy-5-methylphenazenium methyl and sulfate N-methylphenazenium methyl sulfate.

4,595,480

SYSTEM FOR ELECTROPLATING MOLDED SEMICONDUCTOR DEVICES

Hem P. Takiar, San Jose, and Jagdish Belani, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 26, 1985, Ser. No. 780,157
Int. Cl.[4] C25D *17/08*
U.S. Cl. 204—297 W **10 Claims**



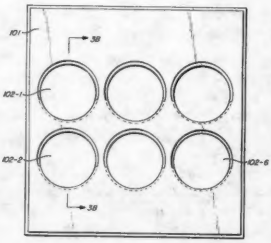
1. A system for electroplating semiconductor lead frame strips, said system comprising:
a magazine capable of receiving and supporting a plurality of individual lead frame strips;
a plating rack capable of removably securing at least one magazine, said plating rack including a multiplicity of resilient contacts and a terminal, said contacts and said terminal being electrically connected; and
electric coupling means for engaging both the lead frame strips and the electric contact members and for evenly distributing current from the terminal among the plurality of lead frames.

4,595,481

DISK CARRIER

Ronald Allen, San Jose, and Tu Chen, Saratoga, both of Calif., assignors to Komag, Inc., Milpitas, Calif.

Filed Aug. 21, 1984, Ser. No. 642,853
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 **5 Claims**



1. A carrier for use in holding a disk, said disk having plane surfaces on opposite sides thereof on which magnetic or other material is to be coated simultaneously, said carrier holding said disk in such a manner as to prevent contact between the

plane surfaces to be coated on the disk and the carrier, said carrier comprising:

a carrier plate;

a first opening formed through said carrier plate, said first opening having a diameter slightly less than the diameter of the said disk, said first opening being circular and formed around a first center line;

a second opening formed partly through said carrier plate, said second opening being formed with a slightly larger than said first opening and being formed only partially around the circumference of said first opening, said second opening being formed about a second center line offset from said first center line by a selected amount, said second opening thereby forming a recess in the carrier plate adjacent a portion of the circumference of said first opening;

wherein said recess extends part way into said carrier plate around a portion of the circumference of the first opening thereby to allow a disk having a diameter slightly more than the diameter of the first opening to be placed in said first opening without contacting the plane surfaces to be coated; and

wherein a portion of a peripheral edge of said disk is aligned with an edge of a wall defining said first opening to prevent cross-contamination and interference between opposing electrodes on both sides of the disk during the simultaneous coating of magnetic or other material on both said plane surfaces of said disk.

4,595,482

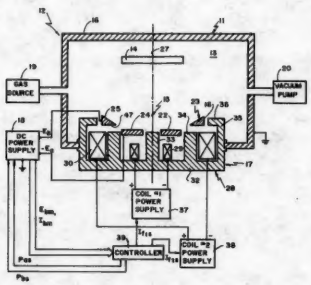
APPARATUS FOR AND THE METHOD OF CONTROLLING MAGNETRON SPUTTER DEVICE HAVING SEPARATE CONFINING MAGNETIC FIELDS TO SEPARATE TARGETS SUBJECT TO SEPARATE DISCHARGES

Donald M. Mintz, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed May 17, 1984, Ser. No. 611,435

Int. Cl.[4] C23C *15/00*

U.S. Cl. 204—298 **37 Claims**



1. Apparatus for controlling a cathode sputter magnetron device so that there is a uniformity of material supplied to a work piece over the lives of plural geometrically spaced targets from which material is sputtered, each target being subjected to a separate plasma discharge that is confined to the associated target by a separate magnetic field, the control apparatus comprising means for deriving a first signal indicative of the target erosion condition, and means responsive to the first signal for controlling the relative powers of the separate plasma discharges so that the relative powers change as a function of the erosion condition.

4,595,483

CATHODE SPUTTERING APPARATUS WITH ADJACENTLY ARRANGED STATIONS

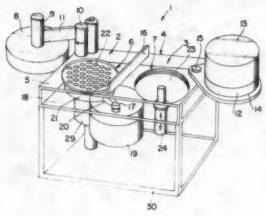
Peter Mahler, Hainburg, Fed. Rep. of Germany, assignor to Leybold Hearaeus GmbH, Cologne, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 716,854

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413001

Int. Cl.[4] C23C *15/00*

U.S. Cl. 204—298 **7 Claims**



1. Cathode sputtering apparatus comprising:

a vacuum chamber;

at least two adjacently arranged stations including a charging station and a coating station;

at least one sputtering cathode means;

a substrate holder able to execute reciprocal movement between said stations;

a pivot bearing passing through said vacuum chamber;

an extension arm on said pivot bearing;

said substrate holder being secured by means of said extension arm eccentrically on said pivot bearing; and

coolant circulation means led through said pivot bearing to said substrate holder.

4,595,484

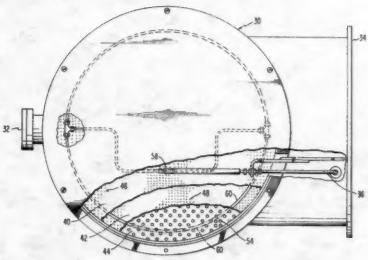
REACTIVE ION ETCHING APPARATUS

Nicholas J. Giammarco, Newburgh, and George A. Kaplita, New Windsor, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1985, Ser. No. 803,190

Int. Cl.[4] C23C *15/00*

U.S. Cl. 204—298 **20 Claims**



1. An etching apparatus comprising:

a vessel;

a cathode plate within said vessel for mounting a workpiece thereon; and

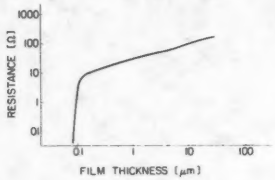
a three-plate anode arranged over said cathode, said anode including upper assembly of spaced-apart first and second perforated parallel plates attached to said vessel and a third perforated plate affixed to said second plate at a predetermined distance below said second plate.

4,595,485

LIMITING ELECTRIC CURRENT TYPE OXYGEN SENSOR

Hideaki Takahashi; Haruyoshi Kondo; Keiichi Saji; Kiyoharu Hayakawa, and Takashi Takeuchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Continuation of Ser. No. 589,503, Mar. 14, 1984, abandoned.
This application Sep. 13, 1985, Ser. No. 775,741
Claims priority, application Japan, Mar. 14, 1983, 58-40630
Int. Cl.[4] G01N *27/56*
U.S. Cl. 204—406 31 Claims



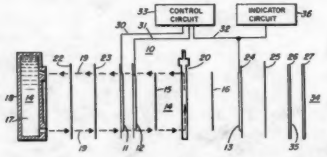
6. A limiting electric current type oxygen sensor comprising an at least partially electrically insulating substrate, a first electrode of a gas-permeable film, a thin and dense solid electrolyte film which has a specific orientation of crystal and a thickness between 0.1 μm and 30 μm, said electrolyte film being devoid of glass-based material, a second electrode of a gas-permeable film, and means for determining a diffusion flow rate of a gas flowing therethrough; said means, said first electrode, said thin and dense solid electrolyte film and said second electrode being sequentially formed on said substrate, and means for applying positive voltage to one electrode, negative voltage to the other electrode and for detecting electrical current flow through said electrodes, thereby enabling said sensor to operate stably even at high temperatures.

4,595,486

ELECTROCHEMICAL GAS SENSOR

John C. Schmidt, Baltimore; Donald N. Campbell, Timonium, and Sandra B. Clay, Baltimore, all of Md., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 1, 1985, Ser. No. 697,595
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—412 21 Claims



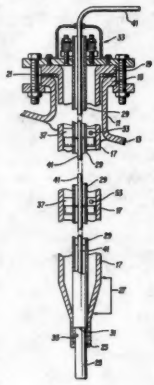
1. An electrochemical gas sensor comprising: a reference electrode, a counter electrode and a sensing electrode spaced apart from each other, an electrolyte in the spaces between said electrodes in contact with each said electrodes, said electrolyte including n-methyl-2-pyrrolidone and a salt soluble therein, circuit means for maintaining a predetermined voltage on said sensing electrode with respect to said reference electrode, and means responsive to electric current from said sensing electrode to provide an indication of the concentration of a gas in an ambient to be monitored.

4,595,487

SENSING PROBE HOLDER SYSTEM

Erwin J. Nunlist, Penfield, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Mar. 18, 1985, Ser. No. 712,839
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—433 9 Claims



1. A sensing probe holder system, operable from the exterior of a closed fluid container, to insert and withdraw a sensor probe assembly, respectively, into and out of said closed fluid container comprising:

(a) a sensor probe assembly comprising:

(i) a sensor tube, segmented into a plurality of segments, and further comprising hinge means, connecting each of said segments together in linear succession, said hinge means which also permit the pivotation of each of said segments from the next of said segments in linear succession at any point where said segments or any of them are withdrawn from holder means;

(ii) a sensor tip mounted to one end of said sensor tube; and

(iii) conduit means, connected to said sensor tip and extending through said sensor tube, adapted to connect said sensor tip to apparatus which is capable of interacting with said sensor tip, said apparatus being located remote from said closed fluid container;

said sensor probe assembly further comprising a cylindrical section;

(b) holder means adapted to surround and enclose said sensor probe assembly except for a portion of said sensor tip;

(c) compressible seal means adapted to seal a junction between said holder means and said portion of said sensor tip which is not surrounded and enclosed by said holder means;

(d) means for said sensor tube to apply compression force to said seal means;

(e) means for applying and continuously urging linear axial thrust to said sensor tube which results in compression force being applied to said seal means;

(f) means for mounting said holder means sealably through a wall of said closed fluid container and positioning said sensor tip in substantial contact with fluid which is within said closed fluid container;

(g) means for removably mounting said sensor probe assembly within said holder means, said means for removably mounting which are entirely operable from the exterior of said closed fluid container; and

(h) means for causing said compressible seal means to be concurrently removed with the removal of said sensor probe assembly."

4,595,488

MULTISTAGE PROCESS FOR THE DIRECT LIQUEFACTION OF COAL

Giancarlo Pecci, Milan; Luigi Carvani, Piacenza; Domenico Valentini, S.Donato Milanese, and Michele Zaninelli, Milan, all of Italy, assignors to ENI-Ente Nazionale Idrocarburi, Rome, Italy

Filed Jun. 7, 1984, Ser. No. 618,181

Claims priority, application Italy, Jun. 8, 1983, 21513 A/83

Int. Cl.[4] C10G *1/00, 1/06*

U.S. Cl. 208—412 **9 Claims**

1. A process for the direct liquefaction of coal, comprising the following steps:

(a) subjecting the coal to a pre-treatment to reduce the ash content of such coal;

(b) mixing the pre-treated coal with a solvent and subjecting the mixture to a dissolution reaction and then (ii) fractionating the product resulting from the dissolution reaction to separate a light stream containing gaseous products, LPG, gasoline and atmospheric gas oil and a heavy stream comprising an atmospheric residue containing ashes and unreacted coal;

(c) (i) subjecting to a hydrotreating reaction a portion of the heavy stream comprising the atmospheric residue, (ii) recycling the balance of the heavy stream as a part of the solvent to be mixed with the pre-treated coal before it is subjected to the dissolution reaction in step (b), (iii) then fractionating the product from the hydrotreating reaction to separate a gaseous stream and a bottom stream consisting of the atmospheric residue, (iv) fractionating the gaseous stream to separate a light stream comprising gaseous products, LPG, gasoline and atmospheric gas oil and a stream which is recycled as a fraction of the solvent to be mixed with the pre-treated coal before it is submitted to the dissolution reaction, and (v) separating the bottom stream into two parts, one of which is recycled as a fraction of the solvent, the other of which is fractionated to separate therefrom a top stream consisting essentially of a vacuum gas oil free of ashes and a bottom stream with a high content of ashes and unconverted coal, such bottom stream being supplied to the gas generating unit for the production of hydrogen;

(d) (i) subjecting to a hydrocracking treatment a stream containing the vacuum gas oil, (ii) fractionating the product resulting from the hydrocracking stream containing gaseous products, LPG, gasoline and atmospheric gas oil, and (iii) supplying this gaseous stream, together with the light stream from the dissolution reaction from step (b) (ii) and the light stream from the fractionating stage of the gaseous stream from the hydrotreating in step (c) (iv), to a final fractionating stage to separate the end products from a stream comprising unconverted matter which is to be mixed with the stream containing the vacuum gas oil before it is submitted to the hydrocracking stage, of part d(i).

4,595,489

REMOVAL OF PHENOLS FROM PHENOL-CONTAINING STREAMS

Charles G. Scouten, Westfield, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 452,956, Dec. 27, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 757,908

Int. Cl.[4] C10G *17/00*

U.S. Cl. 208—263 **11 Claims**

1. A process for recovering phenols from phenol-containing streams, having at least a sufficient amount of water, which method comprises:

(a) contacting the phenol-containing stream with a metal composition consisting essentially of one or more oxides and/or hydroxides of metals capable of forming a metal phenate with phenols of the stream, wherein said contacting is performed below the lower of the following two temperatures (i) the decomposition temperature of the resulting metal phenate, or (ii) the temperature at which detrimental thermal degradation of the stream occurs,

(b) separating the resulting metal phenate from the streams; and

(c) treating the resulting metal phenate with steam at a temperature from about 250° C. to about 450° C., thereby producing phenols, and hydroxides of the metals of the phenate.

4,595,490

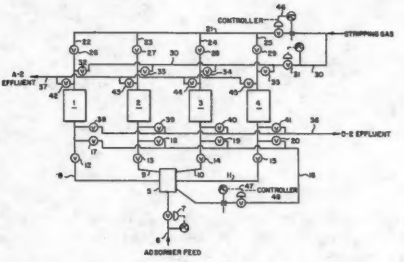
PROCESSING OF HIGH NORMAL PARAFFIN CONCENTRATION NAPHTHA FEEDSTOCKS

Robert L. Gray, Jr., Mahopac, N.Y., and Peter L. Oetinger, Louisville, Ky., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 1, 1985, Ser. No. 718,368

Int. Cl.[4] C10G *25/03*

U.S. Cl. 208—310 R **9 Claims**



1. In an isobaric process for separating normal paraffins from non-normal hydrocarbons in a vapor feed stream by (1) cocurrent purge/adsorption with the selective adsorption of normal paraffins by passage of said feed gas stream to the feed end of an adsorbent bed in a system having four or more beds, with unadsorbed non-normal hydrocarbons displacing residual purge gas from the effluent end of the bed, (2) cocurrent feed-/adsorption with additional quantities of said feed gas mixed with purge effluent from the next succeeding countercurrent purge step (3) being passed to the feed end of the bed, thereby advancing an adsorption front of adsorbed normal paraffins toward the effluent end of the bed, thus displacing non-normal hydrocarbons from the effluent end of the bed for recovery as a co-product stream, (3) countercurrent purge with a stripping gas being introduced to the effluent end of the bed and a purge effluent comprising stripping gas, residual unadsorbed nonparaffins and some desorbed normal paraffins being withdrawn from the feed end of the bed and recycled for mixture with feed gas to the bottom of a bed in said system, and (4) countercurrent displacement with the introduction of stripping gas to the top of the bed and the withdrawal of normal paraffins, together with stripping gas, as a product stream from the bottom of the bed, the improvement comprising carrying out said processing sequence so that, at the end of the cocurrent purge/adsorption and the countercurrent purge steps in one bed, the passage of said feed gas for said cocurrent purge/adsorption step and said stripping gas for said countercurrent purge step are discontinued for an interval of time during which said cocurrent feed/adsorption and countercurrent displacement steps are carried out in an overlapping manner such that at least two beds are on each of said steps during said interval, said feed gas entering the system by initial passage to a mix drum from which said feed gas for the cocurrent purge/adsorption step and said cocurrent feed/adsorption step are passed, said countercurrent purge effluent from step (3) being passed to said mix drum for mixture with said feed gas therein and passage to an adsorbent bed as part of the feed gas for said cocurrent purge/adsorption step and said cocurrent feed step,

whereby the overlap of steps enables concentration and/or flow fluctuations inherent in the process to be obviated, and the process can advantageously be carried out with a desirable reduction in the size of the adsorption system and associated equipment.

4,595,491

PROCESS FOR THE SEPARATION OF AROMATIC HYDROCARBONS FROM A HYDROCARBON MIXTURE OF VARYING AROMATIC CONTENT

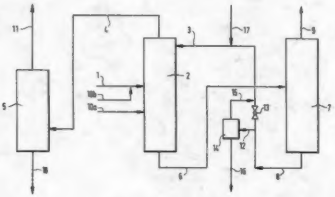
Horst Berns, Mülheim, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,344

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409307

Int. Cl.[4] C10G *21/20*

U.S. Cl. 208—326 **8 Claims**



1. A process for the separation of an aromatic hydrocarbon from a hydrocarbon mixture of varying aromatic content which comprises the steps of:

(a) introducing into a distillation column a hydrocarbon mixture containing an aromatic hydrocarbon, heavy non-aromatic hydrocarbons the boiling points of which lie at least 14° C. above the boiling point of the pure aromatic compound to be recovered, and light non-aromatic hydrocarbons the boiling points of which lie at least 38° C. below the boiling point of the pure aromatic compound to be recovered, whereby the weight ratio of the light non-aromatic hydrocarbons to the heavy non-aromatic hydrocarbons amounts to at least 0.4 to 1;

(b) adding as a selective solvent to the top of the distillation column an N-substituted-morpholine wherein the substituent has up to 7 carbon atoms to contact vapors of said hydrocarbon mixture introduced according to step (a); and

(c) extractively distilling said hydrocarbon mixture to vaporize the non-aromatic hydrocarbons thus forming a head product and to collect the aromatic hydrocarbon dissolved in the selective solvent as a liquid sump product.

4,595,492

RECOVERY OF PHOSPHORUS FROM DILUTE WASTE STREAMS

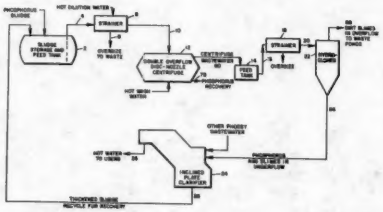
David A. Crea, Pocatello, Id.; James A. Robertson, Levittown, Pa., and Jerry A. Keely, Pocatello, Id., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 379,228, May 17, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 672,524

Int. Cl.[4] B01D *43/00*

U.S. Cl. 209—2 **6 Claims**

1. A process for recovering phosphorus from phosphorus sludge, produced in an electric furnace by reductive heating of agglomerated phosphate shale which comprises, passing said sludge into a centrifugal separator having a rotating bowl which is capable of exerting sufficient centrifugal pressure to break a stable phosphorus emulsion in the sludge and coalesce phosphorus globules present within said sludge and a subsequent recycle underflow stream from a hydrocyclone, coalescing phosphorus globules in said centrifugal separator removing a heavy fraction from one outlet of said separator containing the major portion of phosphorus in coalesced form along with heavy dirt, removing a light fraction containing fine dirt slimes and a minor amount of uncoalesced phosphorus from a second outlet of said separator, introducing said light fraction into a hydrocyclone having a diameter of not substantially larger than about 1-inch under sufficient pressure to effect a separation of phosphorus particles larger than about 8–15 micrometers from slime particles smaller than about 8–15 micrometers, recovering an underflow stream from the hydrocyclone containing a preponderance of the introduced phosphorus parti-



cles in a substantially uncoalesced form along with a reduced amount of dirt slimes, removing an overflow stream from the hydrocyclone containing a preponderance of the slimes and reduced amounts of phosphorus, recycling said underflow stream to said centrifugal separator, coalescing phosphorus contained in the recycled underflow stream having a particle size larger than about 8–15 micrometers within said centrifugal separator along with phosphorus globules contained in the sludge, and recovering said heavy fraction containing coalesced phosphorus from said centrifugal separator.

4,595,493

PROCESS FOR THE FLOTATION OF BASE METAL SULFIDE MINERALS IN ACID, NEUTRAL OR MILDLY ALKALINE CIRCUITS

D. R. Nagaraj, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 17, 1984, Ser. No. 641,658

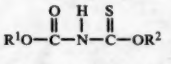
Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **13 Claims**

1. A process for the beneficiation of base metal sulfide minerals from base metal sulfide ores with selective rejection of gangue sulfide minerals at a pH value of less than 10.0, said process comprising:

(a) providing an aqueous pulp slurry of finely divided, liberation-sized ore particles having a pH of less than 10.0;

(b) conditioning said pulp slurry with effective amounts of a frothing agent and a metal collector, respectively, said metal collector comprising at least one hydrocarboxycarbonyl thionocarbamate compound having the formula:



wherein R^1 is C_1–C_6 alkyl and R^2 is C_1–C_8 alkyl;

(c) thereafter, frothing the base metal sulfide minerals by froth flotation;

(d) and recovering the base metal sulfide minerals.

4,595,494

APPARATUS FOR SEPARATING FERROMAGNETIC PARTICLES FROM A SLURRY

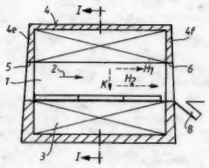
Karl-Heinz Kukuck, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 650,258

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336255

Int. Cl.⁴ B03C *1/14*

U.S. Cl. 209—224 **9 Claims**



1. Apparatus for use in separating ferromagnetic particles from a slurry, said apparatus comprising a separator having an annular magnetic coil forming and encircling a substantially horizontal, tunnel-shaped channel through which the slurry flows, said coil enabling the production of a magnetic field which passes through the channel; and an annular, continuous, asymmetrical iron yoke encircling the magnetic coil and so arranged relatively thereto that the magnetic field strength in the channel increases from its top towards its bottom.

4,595,495

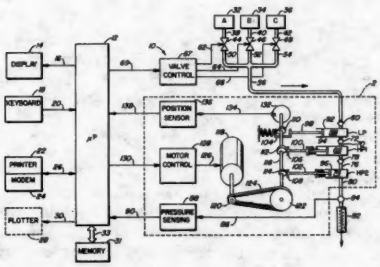
PROGRAMMABLE SOLVENT DELIVERY SYSTEM AND PROCESS

Reuben Yotam, and Joseph G. Carleton, both of Palo Alto, Calif., assignors to Eldex Laboratories, Inc., San Carlos, Calif.

Filed Feb. 22, 1985, Ser. No. 704,201

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 210—101 **24 Claims**



1. A solvent delivery system, which comprises first and second pistons and cylinders operatively coupled to first and second cams and cam followers, said first and second cams each having a ramped portion and an abrupt step, said first cylinder being connected to a plurality of solvent component inlets to fill said first cylinder with the solvent components during movement of said first cam follower along the ramped portion of said first cam, a first biasing means connected to urge said first piston forward into said first cylinder, movement of said first cam follower over the abrupt step of said first cam allowing said first piston to move forward abruptly to force the solvent components from said first cylinder into said second cylinder, a second biasing means connected to urge said second piston back in said second cylinder, said second cam being reversely arranged relative to said first cam, so that movement of said second cam follower over the abrupt step of said second cam allows said second piston to move back abruptly in said second cylinder to allow the solvent components to enter and be mixed to form a solvent mixture in said second cylinder, movement of said second cam follower along the ramped portion of said second cam moving said second piston forward into said second cylinder to force the solvent mixture from said second cylinder, a third piston and cylinder, said third cylinder having a lesser volume than said first cylinder and said second cylinder, a third cam and cam follower coupled to reciprocate said third piston in said third cylinder, said third cam being configured and positioned relative to said second cam so that said third piston moves back in said third cylinder when said second piston moves forward in said second cylinder, said second cylinder and said third cylinder being connected so that said second cylinder delivers the solvent mixture to an outlet and fills said third cylinder while said second piston moves forward in said second cylinder and said third piston moves back in said third cylinder, and said third cylinder delivers the solvent mixture to the outlet while said third piston moves forward in said third cylinder, said solvent component inlets fill said first cylinder and said first piston and cylinder fill said second cylinder, and first, second and third check valves, said first check valve being connected between said plurality of solvent component inlets and said first cylinder, said second check valve being connected between said first cylinder and said second cylinder and said third check valve being connected between said second cylinder and said third cylinder.

4,595,496

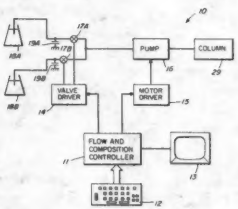
LIQUID COMPOSITION CONTROL

William W. Carson, Mendon, Mass., assignor to Millipore Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 625,931, Jun. 29, 1984, abandoned. This application Aug. 8, 1985, Ser. No. 763,743

Int. Cl.⁴ B01D *15/08*

U.S. Cl. 210—101 **10 Claims**



1. A liquid chromatography system comprising:

a column;

a plurality of reservoirs each containing a liquid to be mixed together to form a mobile phase;

a pump having an inlet and an outlet;

a plurality of flow conduits for connecting each of said reservoirs to the inlet of said pump for delivery over a range of flow rates to said column;

valve means interposed between each of said reservoirs and said pump inlet;

means for selectively activating each of said valve means to admit liquid from each of said reservoirs into said pump inlet, the total actuation time for each valve means participating in the formation of the mixture defining a switching valve cycle time, and the proportion of the time each of said valve means is activated to said switching valve cycle time defining the composition of the resulting mixture;

means for generating a ratio of said switching valve cycle time to the cycle time of said pump, said ratio being a non-integer; and

accumulator means associated with each of said reservoirs and

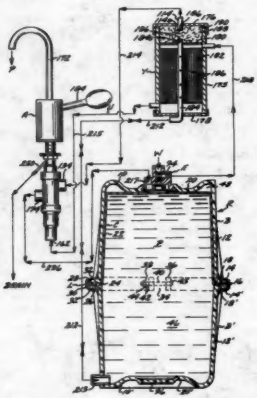
located between said reservoirs and said valve means to permit the fluid flow through said valve means to accurately correspond to the rate of fluid volume displacement during the inlet draw stroke of said pump.

4,595,497

PURIFIED WATER REVERSE OSMOSIS RESERVOIR

Bruce D. Barrows, 363 Orizaba St., Long Beach, Calif. 90814

Filed Jul. 23, 1984, Ser. No. 545,880
Int. Cl.[4] B01D *31/00*
U.S. Cl. 210—110 **13 Claims**



1. In combination with a source of pressurized feed water; flow restrictor means in communication with a drain; and a reverse osmosis cartridge that has a pressurized feed water inlet, a pure water outlet, and a reject water outlet; a single valve supporting reservoir assembly capable of being substantially filled with pure water from said pure water outlet for future dispensing with a minimum back pressure on said water as said pure water discharges from said reverse osmosis cartridge and said pure water so stored at all times under a pressure substantially less than that of said pressurized water at said source, said single valve supporting reservoir assembly including:

(a) a pair of rigid cup shaped bodies that are oppositely disposed and include a pair of circumferential first edge portions that are adjacently disposed;

(b) a pliable barrier that includes a circumferential second edge portion;

(c) first means for forcing said first edge portions into sealing engagement with said second edge portion for said pair of cup shaped bodies to define a reservoir that includes an interior in which said barrier is disposed to sub-divide said interior into first and second confined spaces of variable volume;

(d) second means for discharging pure water from said pure water outlet into said first confined space until said first confined space occupies substantially all of said interior of said reservoir, and said second means allowing pure water to be dispensed from said first confined space when pressure is applied to said pure water therein;

(e) third means for selectively discharging reject water from said reject water outlet to said flow restrictor means when pure water is discharging into said first confined space or to by-pass said flow restrictor means and flow to said second confined space to expand said second confined space and apply pressure to pure water in said first confined space and dispense pure water therefrom, said reject water when by-passing said flow restrictor means flowing at a sufficiently rapid rate as to fast flush a membrane of said reverse osmosis cartridge, said third means allowing reject water in said second confined space to flow therefrom as pure water flows into said first confined space to expand said first confined space;

(f) a single valve supported on one of said cup shaped bodies that includes an inlet in communication with said source of pressurized feed water and an outlet in communication with said inlet of said reverse osmosis cartridge, said single valve including a movable portion that in a first position obstructs communication between said inlet in said valve and said outlet therein and in a second position establishing communication between said inlet and outlet in said valve, said movable portion at all times having a first force exerted thereon by pressurized feed water that tends to move said movable portion from said first to said second position; and

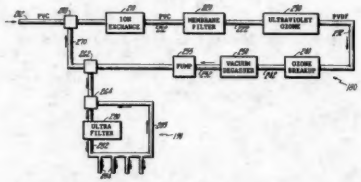
(g) mechanical fourth means in said second confined space responsive to a movement of said pliable barrier for exerting a second force on said movable portion of said valve greater than said first force and in a direction opposite thereto to throttle and reduce a rate of flow of pressurized feed water from said outlet of said valve as said pliable barrier moves through a last stage as said first confined space fills with pure water.

4,595,498

WATER-POLISHING LOOP

Judith S. Cohen, Dallas; Joel W. Browning, Flower Mound, and Wilford H. Gopffarth, Fort Worth, all of Tex., assignors to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Dec. 27, 1984, Ser. No. 686,861
Int. Cl.[4] B01D *13/00, 15/04*
U.S. Cl. 210—192 **5 Claims**



1. In a water-purification system, an improved water-polishing loop comprising:

an inlet pipe for receiving previously purified water;

an ultraviolet-light exposure unit;

an ion-exchange unit;

a first filter unit;

an outlet pipe;

a first recirculation pipe connected between said outlet pipe and said inlet pipe for recirculating highly purified water from said outlet pipe back to mix with said previously purified water, and thereby forming a first recirculation loop;

means for flowing water through said ultra-violet light exposure unit, ion-exchange and first filter units; characterized in that:

said ion exchange unit is followed by said first filter and ultraviolet-light exposure units;

said ultraviolet exposure unit is preceded by an ozone oxidation unit;

said ultraviolet exposure unit is followed by a vacuum degassification unit, whereby gaseous products of said ozone oxidation unit are removed; and

a second recirculation loop connected to said outlet pipe and which second loop comprises an ultrafilter having an ultrafilter inlet and being connected between said outlet pipe and at least one feed outlet and a second recirculation pipe connected between said at least one feed outlet and said ultrafilter inlet.

4,595,499

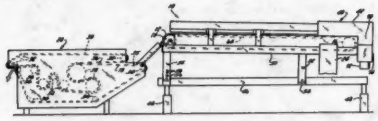
GRAVITY BELT THICKENER AND BELT PRESS COMBINATION

Richard Kormanik, Mukwonago; Karen Dejewski, Franklin, and Robert Brummond, Waukesha, all of Wis., assignors to Envirex Inc., Waukesha, Wis.

Continuation-in-part of Ser. No. 667,797, Nov. 2, 1984. This application Oct. 7, 1985, Ser. No. 784,904

Int. Cl.[4] B01D *33/04;* B30B *3/00, 9/24*

U.S. Cl. 210—202 3 Claims



1. Apparatus for use in removing water from sewage sludge, the apparatus comprising:

a belt press including a frame, a pair of belts for compressing sludge material therebetween, said belts being water-permeable whereby water in said sludge may drain through said belts, and means for supporting said belts so as to compress sludge material between said belts, said means for supporting including a plurality of rollers supported by said frame, said belts having a first width;

means for reducing the water content of the sludge prior to depositing the sludge on the belt of the belt press, said means for reducing the water content of the sludge including at least one gravity belt thickener adjacent said belt press, said gravity belt thickener including a belt having a belt flight adapted to support sewage sludge thereon and having opposite ends, one of said ends being supported by a first roller and being adapted to have sludge deposited thereon and the other of said ends being supported by a second roller and comprising a sludge discharge end, said gravity belt thickener belt being water-permeable whereby water drains through said belt when sewage sludge is deposited on said belt and solid material in the sewage sludge is supported by said belt, said discharge end of said belt flight being positioned adjacent said belt press such that sludge from said belt of the gravity belt thickener is deposited on one of the belts of the belt press, and said belt of said gravity belt thickener having a width greater than the width of said belt of said belt press;

wherein the ratio of the width of the belt of the gravity belt thickener and the width of the belt of the belt press is proportional to the ratio of the solids content of the sludge deposited on said one of said ends of the belt of the gravity belt thickener and the solids content of the sludge on said discharge end of the belt of the gravity belt thickener; and

means for guiding the sludge from the belt of the gravity thickener to the pair of belts of reduced width of the belt press.

4,595,500

FILTER FOR PURIFYING DRINKABLE AND NON-DRINKABLE WATER

Mauro Galbiati, 17 Aspromonte Square, Milan, Italy

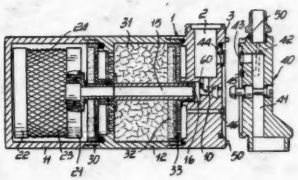
Filed Jul. 12, 1984, Ser. No. 630,212

Claims priority, application Italy, Jul. 28, 1983, 22535/83[U]; Feb. 17, 1984, 19693 A/84

Int. Cl.[4] B01D *25/02*

U.S. Cl. 210—266 11 Claims

1. A filter for purifying drinkable and non-drinkable water, which comprises a water inlet, a first body (1) adapted for association with said water inlet and defining an inlet end (2) in communication with a purifying filter having, sequentially arranged, a bacteria hold-back membrane (23), an active carbon zone (31), and a diverting means (40, 74) in proximity of said inlet end (2) and in proximity of said first body (1), said diverting means being positionable in a first position, where said inlet end (2) is in communication with a direct water dispensing conduit (41, 71) and the water bypasses said purifying filter, and in a second position where communication between said inlet end (2) and said direct water dispensing conduit (41, 71) is cut off, and dispensing through a purified water conduit (42, 71) is allowed wherein said filter comprises means for selectively arranging said diverting means in said first or second position, said purifying filter has one modular segment



(12) which contains active carbon (31) and wherein said segment (12) containing active carbon (31) is closed, at least at its outlet end by a felt filtering disk (32), said filter comprises a grid (33) externally of said filtering disk (32), said disk (32) pressing against said grid, and an outlet chamber (35) is defined between said filter body and sail purifying filter, said outlet chamber being selectively in communication with said purified water conduit.

4,595,501

HORIZONTAL ENDLESS BELT VACUUM FILTERS

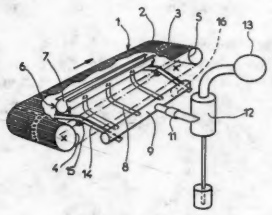
Christian Queyroix, 29, avenue de Condé, 78600 Maisons Laffitte, France

Filed Apr. 13, 1984, Ser. No. 600,331

Claims priority, application France, Apr. 14, 1983, 83 06097

Int. Cl.[4] B01D *33/04, 33/40*

U.S. Cl. 210—400 25 Claims



1. A horizontal endless belt vacuum filter comprising:

(a) an endless conveyor belt having means defining at least one opening for filtering a mass;

(b) an assembly comprising a plurality of transverse bars and means for applying a vacuum connected to the plurality of transverse bars;

(c) an endless filtering medium passing over guide rollers for receiving a mass to be filtered;

(d) the plurality of transverse bars being pivotally mounted about a longitudinal pivot axis;

(f) the assembly mounted to pivot, as a whole, about the longitudinal pivot axis to allow for access to the means for applying a vacuum.

4,595,502

PILE COMPRISING A PLURALITY OF FILTER PAPER SHEETS WITH RECESSES

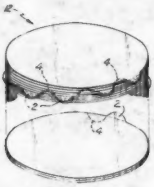
Fritz Himmelsbach, Artherstrasse 163, 6317 Oberwil, Switzerland

Continuation of Ser. No. 541,011, Oct. 12, 1983, abandoned. This application Dec. 27, 1984, Ser. No. 686,665

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237702

Int. Cl.[4] B01D *35/02*

U.S. Cl. 210—483 1 Claim



1. A pile comprising a plurality of coaxially arranged, stacked, cup-like filter sheets of substantially equal size; each filter sheet having a generally flat circular bottom wall and a generally frustoconical undulated side wall; said plurality of sheets including first sheets, the top edge of the frustoconical side wall of said first sheets having a first shape consisting essentially of a recess in the plane of said sheet to facilitate removal, and second sheets, the top edge of the frustoconical side wall of said second sheets having a second shape; said first sheets and said second sheets being alternately arranged within said pile; the second shape of the top edge of the frustoconical side wall being an uninterrupted undulated shape formed by punching, creasing and shaping in the cup portion to provide an edge portion of the cup portion underlying the recess; and each of the recesses in alternating sheets being located in staggered relation in a different position in respect to the top sheet of the pile whereby removal of the sheet with the recess and the underlying sheet at the adjacent recess location is facilitated.

4,595,503

ULTRAFILTRATION MEMBRANE OF POLYAMIDE

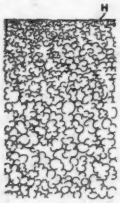
Erich Schindler, Aschaffenburg, and Franz Maier, Obernburg, both of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Continuation-in-part of Ser. No. 285,136, Jul. 20, 1981, Pat. No. 4,482,514. This application Oct. 10, 1984, Ser. No. 659,072

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028213

Int. Cl.[4] B01D *39/00*

U.S. Cl. 210—500.38 3 Claims



1. Flat membranes of a polyamide, a copolyamide or a mixture of polyamides, suitable for ultrafiltration and comprising an ultrafiltration skin and a porous backing layer, the pore size in said backing layer increasing with distance from said ultrafiltration skin, produced by dissolving the polyamide in at least 75% concentration formic acid, applying said casting solution, containing about 12–22% by weight polyamide and 1–7% by weight polyethylene glycol in formic acid and brought to a temperature of below about 18° C., as a thin layer onto a carrier foil resistant to the solution components, introducing said casting solution on said casting foil into a precipitation and washing bath, withdrawing said casting solution as a coagulated and washed membrane from said carrier foil, stretching said coagulated and washed membrane in at least one direction to a ratio from 1.5:1 up to 2.5:1 and subsequently drying said coagulated and washed membrane.

4,595,504

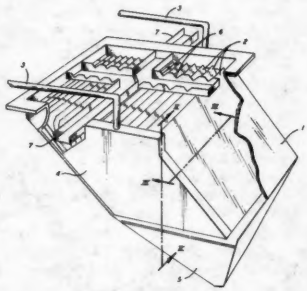
LAMELLA SEDIMENTATION DEVICE

Goran Hellman, Miami Lakes, and Brian E. Garrison, Miami, both of Fla., assignors to SFS Swede Filter System, Inc., Miami Lakes, Fla.

Continuation of Ser. No. 375,650, May 6, 1982, abandoned. This application Feb. 22, 1984, Ser. No. 582,323

Int. Cl.[4] B01D *17/028*

U.S. Cl. 210—519 9 Claims



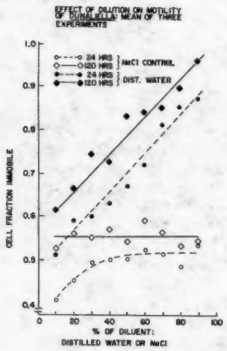
1. A lamella sedimentation device which comprises a package of sedimentation lamellas arranged parallely close to each other and sloping in relation to the horizontal plane said device being provided with an influent feed chamber wherein liquid flows in a substantially vertical direction, said influent feed chamber having an inner wall adjacent said package of sedimentation lamellas and an outer wall spaced therefrom said device being further provided with inlet means at the lower end thereof and extending along part of the height extension of the lamellas package for introducing a liquid between the lamellas in a flow direction which is essentially parallel to the plane of the lamellas and essentially horizontal, said inlet means being fed by said influent chamber and, there being provided a throat restriction in said influent chamber upstream of said point of introduction between the lamellas said restriction being in the form of a restrictor mounted on at least one of said walls of said influent feed chamber and a deflector plate mounted on the outer wall of said influent chamber said deflector being positioned at the point of introduction of the liquid into the package of sedimentation lamellas and being progressively inclined in the down stream direction so as to change the direction of liquid flow from substantially vertical to substantially horizontal so as to produce a venturi effect at said point of introduction thereby accelerating the liquid flow in a direction parallel to the plane of said lamellas and substantially perpendicular to the direction of lamella flow along said lamellas.

4,595,505

METHOD FOR SUPPRESSING ALGAL GROWTH IN SOLAR PONDS

Inka Dor, Jerusalem, Israel, assignor to Solmat Systems, Ltd., Yavne, Israel

Filed May 30, 1984, Ser. No. 615,480
Int. Cl.[4] C02F *3/32*; F24G *3/02*; C12N *1/12*
U.S. Cl. 210—602 6 Claims



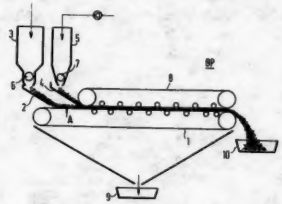
1. A process for controlling algal growth in the wind-mixed layer of a salt water solar pond having a halocline located below the wind-mixed layer and a heat storage layer located below the halocline, wherein the halocline has a downwardly directed salt gradient and a temperature profile that follows the salinity profile, comprising rapidly changing the salinity in the wind-mixed layer for rapidly changing the osmotic pressure on algae in the wind-mixed layer which are sensitive to rapid changes in ambient salinity by an amount effective to cause such algae therein to sink into a region of increased temperature.

4,595,506

FILTERING AID FOR THE TREATMENT OF SUSPENSIONS, PARTICULARLY OF DOMESTIC, INDUSTRIAL, AND OTHER SLUDGES FOR SUBSEQUENT DRAINING

Franz X. Kneer, Eschenburg-Eibelshausen, Fed. Rep. of Germany, assignor to Gebrüder Weiss K.G., Dillenburg, Fed. Rep. of Germany

Division of Ser. No. 255,814, Apr. 20, 1981, abandoned, which is a continuation-in-part of Ser. No. 56,196, Jul. 19, 1979, abandoned. This application Dec. 21, 1983, Ser. No. 550,484
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831384
Int. Cl.[4] C02F *11/12*
U.S. Cl. 210—609 7 Claims



1. A method for draining waste sludge suspensions comprising applying a uniform, loosely placed layer of a filtering aid comprising a mixture of porous, particulate, largely decomposed but biologically active compost having a fibrous structure and a water content from about 30 to 50 percent by weight, and having been communicated into a uniform structure with an average particle size of no more than 10 cm, with the capability to absorb liquids and sludge particles and having particle sizes larger than the sludge particles, and having a thickness of about 2 to 10 cm, onto the screen belt of a traveling screen press, impregnating the layer by spraying it with the suspension to be drained, and then draining the layer under pressure.

4,595,507

MEMBRANE SEPARATION OF HYDROCARBONS

Y. Alice Chang, Des Plaines; Sudhir S. Kulkarni, Hoffman Estates, and Edward W. Funk, Highland Park, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 3, 1984, Ser. No. 637,639
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—638 6 Claims

1. A process for the separation of a deasphalted crude oil and a light hydrocarbon solvent from a mixture thereof comprising passing said mixture across a polysulfone membrane at separation conditions whereby said light hydrocarbon solvent is recovered as the permeate and said deasphalted crude oil is recovered as the retentate, said membrane being prepared by a process wherein said polysulfone polymer is initially contacted in the form of a solution with a sulfonation agent under conditions suitable to achieve a degree of sulfonation of said polysulfone of from about 15 to about 50 percent, with said polysulfone subsequently being solution cast to form said membrane.

4,595,508

REDUCTION OF SODIUM/AMMONIUM ALKALINITY IN INDUSTRIAL WASTEWATER

Edward I. Wolfe; David H. Wasserstrom, both of Whippany, and Richard Kilpert, Berkeley Heights, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 7, 1984, Ser. No. 607,664
Int. Cl.[4] C02F *1/42*
U.S. Cl. 210—631 9 Claims

1. A process for reducing sodium and ammonium alkalinity of wastewater comprising the step of contracting said wastewater, possessing a sodium alkalinity/ammonium alkalinity greater than 1.0, and a hardness/alkalinity ratio less than 1.0, with a weak acid cation exchange resin, in hydrogen ion form, and continuing said contacting for a time sufficient to reduce the sum of said resulting sodium alkalinity and said ammonium alkalinity to about 10 mg./1 as $CaCO_3$ or less.

4,595,509

CONTINUOUS SEPARATION PROCESS

Lawrence L. Fox, Bethel Park, and Nelson J. Merrick, McCandless, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 9, 1984, Ser. No. 639,091
Int. Cl.[4] C02F *1/28*
U.S. Cl. 210—665 20 Claims

1. A continuous physical separation process for purifying water contaminated with low level concentrations of PCB's without replacement or disposal of filter bed media comprising:

(a) passing water contaminated with low level concentrations of PCB's in the range of about 1–20 ppb through a filter bed of hard, substantially non-porous, inorganic particles to separate said PCB's and form contaminated particles and purified water of reduced PCB's concentration;

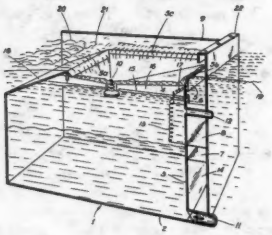
(b) hydraulically shearing said contaminated particles to remove said PCB's and form decontaminated particles and a concentrated PCB's effluent; and

(c) recycling said decontaminated particles to said filter bed.

4,595,510
METHOD AND PLANT FOR COLLECTING OF OIL FLOATING ON WATER

Per Winbladh, Dalgårdsvägen 4, S-240 20 Furulunds Station, and Gert Garin, Kulladalsgatan 12A, S-214 64 Malmö, both of Sweden

Continuation-in-part of Ser. No. 55,727, Jul. 9, 1979, abandoned. This application Jan. 4, 1982, Ser. No. 336,647
Int. Cl.[4] B01D *17/02*
U.S. Cl. 210—776 10 Claims



1. A method for recovering oil floating on water in a layer comprising the steps of:

floating a container in the water, the container including an upper surface positioned partially below the water surface and a collar surrounding substantially three sides of the container leaving the fourth side open, the collar and the upper surface together integrally forming the sides and bottom respectively of an artificial calm bay, the upper surface comprising a first surface immovably affixed to said container, sloping upwards from the fourth open side from a front edge positioned far below the water surface towards an upper edge substantially parallel to the open side, and a second surface sloping downwards from said upper edge, the container further having a small portion thereof extending above the water surface and a substantial portion thereof reaching far below the water surface, whereby the container is affected in position and orientation only to a limited extent by motions in and above the surface of the water, including wave motions, surface streams and wind action;

adjustably ballasting the depth and inclination of the container in accordance with wave height so as to bring the container to a disposition having an upper edge of the upper surface positioned at substantially the level of the boundary between the water and the layer of oil, so that waves entering the open side gradually are affected by the first surface in order to transform essentially vertical movements of particles of the water into an elliptical movement having an essentially horizontal movement component at the water surface towards the upper edge in order to force oil floating on the surface over said upper edge to said second surface without a substantial portion of water;

introducing the mixture of oil and water passing over said upper edge to the interior of the container;

permitting the oil and water to separate in the container; and

discharging the separated water to the surroundings.

4,595,511
PROCESS FOR STIMULATING PETROLEUM PRODUCTION WELLS

Anton Seybold, Höchstadt an der Aisch, Fed. Rep. of Germany; Alejandro Gutierrez, Mendoza, Argentina; Pablo Arkenberg, Buenos Aires, Argentina, and Mario Daino, Mendoza, Argentina, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 15, 1984, Ser. No. 580,431
Claims priority, application Argentina, Feb. 16, 1983, 292148
Int. Cl.[4] E21B *37/06*
U.S. Cl. 252—8.55 B 1 Claim

1. A process for dissolving high molecular weight constituents of petroleum in underground formations communicating with a production well which comprises injecting into the production well high-flash aromatic liquid having a flash point above 40° C. and a minimum proportion of about 90% of mono- or poly-C_1–C_{10}-alkyl-substituted C_6–C_{14} aromatic hydrocarbons or C_6–C_{14}-cycloalkanes, the balance comprising non-cyclic hydrocarbons said liquid containing 1 to 30% by weight of a mixture comprising

10 to 70% by weight of oxyalkylated amine, said oxyalkylated amine being obtained by reacting an amine of the formula R^1R^2NH, wherein R^1 denotes C_{12}–C_{22}-alkyl or C_{12}–C_{22}-alkenyl, and R^2 denotes hydrogen, C_{12}–C_{22}-alkenyl or C_{12}–C_{22}-alkyl, with 4 to 20 moles of ethylene oxide, 6 to 12 moles of propylene oxide or 4 to 20 moles of a mixture of the two alkylene oxides;

1 to 30% of emulsion breaker;

1 to 30% of mono-, di-, or tri-(C_4–C_{12})alkylphenols containing 4 to 40 units of ethylene oxide, propylene oxide or a mixture thereof;

1 to 30% of C_{12}–C_{22}-fatty acids; and

1 to 50% of mono- or di-(C_3–C_8)-alkyl, di-, tri- or tetra-ethylene glycol ethers.

4,595,512
PROCESS FOR THE PREPARATION OF MICROEMULSIONS BETWEEN AN ACID PHASE AND A HYRDOPHOBIC PHASE

Jacques Tellier, Lons, and Jean-Claude Gautier, Billere, both of France, assignors to Societe Nationale Elf Aquitaine, France

Continuation of Ser. No. 254,212, Apr. 15, 1981, abandoned. This application Sep. 19, 1983, Ser. No. 533,621
Claims priority, application France, Apr. 18, 1980, 80 08750
Int. Cl.[4] E21B *43/27*
U.S. Cl. 252—8.55 C 14 Claims

1. A process for preparing a thermodynamically stable microemulsion of a strong acid phase, said strong acid being an inorganic acid or an acid complex selected from $H_3PO_4BF_3$ and BF_3H_2O and a hydrocarbon or trichloroethane phase, one of said phases in the microemulsion being droplets of 0.0005–0.2 micron, said strong acid phase being said strong acid or aqueous strong acid having an acid concentration of at least 15% by weight comprising mixing said hydrocarbon or trichloroethane phase with said acid phase, a cationic quaternary ammonium salt surfactant and an alcohol cosurfactant such that the quantity of acid in the resulting microemulsion is 2.9 to 32.2% by weight and the weight ratio of consurfactant to surfactant is 0.5–1.9.

4,595,513
OIL BASE WELL TREATING FLUIDS THICKENED BY BLOCK COPOLYMERS

Lee N. Morgenthaler, Houston, and Wayne J. Mikols, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 10, 1984, Ser. No. 639,752
Int. Cl.[4] E21B *43/26, 43/04*
U.S. Cl. 252—8.55 R 12 Claims

1. An oil based well treating fluid, comprising:

a liquid mixture of aliphatic and aromatic hydrocarbons containing (1) at least one dissolved or dispersed polymer

of the group consisting of at least one arene/diene block copolymer and mixtures of at least one arene/diene block copolymer with one or more solution-compatible thermoplastic polymers, with said block copolymers having at least one elastomeric block portion and one or more thermoplastic block portions and (2) at least one free-radical-forming polymer crosslinking agent of the group consisting of alkyl peroxides, dialkyl peroxides, hydroperoxides, acyl peroxides and peroxy ketals capable of crosslinking at least one of said dissolved or dispersed polymers within the liquid mixture at a temperature between the surface temperature at the well side and the reservoir temperature; and

within said liquid mixture, kinds and amounts of aromatic hydrocarbons, polymeric materials and types and amounts of polymer crosslinking agents which are correlated relative to the reservoir temperature and the well treatment design so that (a) at surface locations, the viscosity of the liquid mixture is low enough for pumpability but high enough for a low fluid loss into the reservoir, rocks, and (b) when the temperature of the liquid mixture is increased, the viscosity is, or becomes, high enough to suspend solid particles and, (c) when the liquid is maintained at reservoir temperature for a selected time, the viscosity becomes low enough for an effective removal of the liquid.

4,595,514

BORON-CONTAINING HETEROCYCLIC COMPOUND AND LUBRICATING COMPOSITIONS CONTAINING SAME

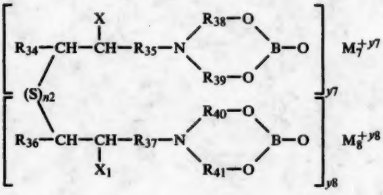
Richard A. Holstedt, Whittier, and Michael C. Croudace, Huntington Beach, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 525,719, Aug. 23, 1983, abandoned, and a continuation-in-part of Ser. No. 525,691, Aug. 23, 1983, abandoned. This application Jan. 29, 1985, Ser. No. 695,960

Int. Cl.⁴ C10M *1/20, 1/32, 1/54;* **C07F** *5/04*

U.S. Cl. 252—46.4 **89 Claims**

1. A compound of the formula:



wherein:

y_7 and y_8 are the same or different integer from 1 to 4;

M_7 and M_8 are the same or different inorganic or organic radical;

X and X_1 are the same or different halogen;

R_{34} and R_{36} are the same or different inorganic or organic radical;

R_{35} and R_{37} are the same or different C_1 to C_{30} or organic radical;

R_{38}, R_{39}, R_{40} and R_{41} are the same or different C_1 to C_{50} organic radical; and

n_2 is an integer from 1 to 4.

4,595,515

VIBRATION-ISOLATING ARTICLE

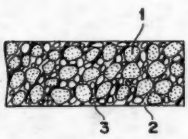
Kikuo Wakino; Michihiro Murata, and Shunjiro Imagawa, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 28, 1984, Ser. No. 644,978

Claims priority, application Japan, Aug. 30, 1983, 58-159323

Int. Cl.⁴ E04B *1/74;* **F16F** *7/00;* **H01L** *41/04, 41/18*

U.S. Cl. 252—62 **5 Claims**



1. A vibration-isolating article composed of a composite material comprising 60–99% of a powdered piezoelectric material and 1–40% of a high polymer, said composite material having electrical leakage paths, wherein said electrical leakage paths are formed by 0.1–10% powdered electrically conductive material dispersed in a matrix of the high polymer so that contact is made between adjacent particles of the powdered piezoelectric material and the powdered electrically conductive material.

4. A vibration-isolating article composed of a composite material comprising 60–99% of a powdered piezoelectric material and 1–40% of a high polymer, said composite material having electrical leakage paths, whrein said electrical leakage paths are formed by electrically conductive coatings formed on particle surfaces of the powdered piezoelectric material.

4,595,516

HEAT STORAGE MATERIAL

Takahiro Wada, Katano; Fumiko Yokotani, Ibaraki; Yoshihiro Matsuo, Neyagawa, and Hiroshi Yoneno, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 3, 1984, Ser. No. 677,248

Claims priority, application Japan, Dec. 5, 1983, 58-229317; Jun. 21, 1984, 59-127917

Int. Cl.⁴ C09K *5/06*

U.S. Cl. 252—70 **6 Claims**

1. A heat storage material characterized by comprising a system consisting of sodium acetate (CH_3CO_2Na) and water (H_2O) incorporated with a fluorine ion-containing salt which is in solid state at the crystallizing temperature of sodium acetate trihydrate, as a nucleating agent for sodium acetate trihydrate.

4,595,517

COMPOSITION FOR REMOVING SCALE FROM A SURFACE COMPRISING ALPHA-HYDROXY CARBOXYLIC ACID AND THICKENER

Khodabandeh Abadi, 5719 N. Camino Del Conde, Tucson, Ariz. 85718

Filed Aug. 24, 1983, Ser. No. 526,016

Int. Cl.⁴ C02F *5/10;* **C23F** *11/10;* **C23G** *1/02*

U.S. Cl. 252—82 **16 Claims**

1. A descaling composition consisting essentially of

(a) an aliphatic carboxylic acid of 2–5 carbon atoms having an alpha-substituted hydroxyl group;

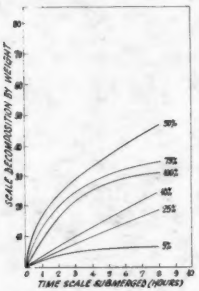
(b) a natural gum or synthetic polymeric thickener which is water soluble at a pH of 3 or below;

(c) sodium silicate; and

(d) water;

wherein the acid is within the range of from about 5 to about

35 percent by weight of the composition, the gum or thickener is between about 0.001 and about 0.3 percent by



weight of the composition; and the ratio by weight of sodium silicate to acid is within the range of 0 to 0.6.

4,595,518

COATING FIBROUS SUBSTRATES WITH FLUOROPOLYMER AMPHOTERIC POLYMER AND SURFACTANTS

Stuart Raynolds, Wilmington, Del., and Rudolph G. DiFilipantonio, Pennsville, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 753,301, Jul. 10, 1985, abandoned. This application Sep. 11, 1985, Ser. No. 775,105

Int. Cl.[4] **D06M** *15/10;* **B05D** *3/02*

U.S. Cl. 252—8.6 **4 Claims**

1. A process for imparting oil- and water-repellency to a fibrous substrate which comprises applying thereto an effective amount of a composition prepared by first combining one or more fluorocarbon dispersions or polyfluoroalkyl-containing polymeric latexes containing an anionic surfactant with a nonionic an HLB of 15±3 and then with an amphoteric polymer in an amount sufficient to make the composition slightly cationic, thereby facilitating deposition of said composition to said substrate.

4,595,519

METAL CLEANING COMPOSITIONS

Tadayoshi Takeno; Koichi Ishii, both of Kurashiki; Koichi Yamane; Kazuo Kita, both of Wakayama; Toshio Iwasaki, and Koichi Hirase, both of Kurashiki, all of Japan, assignors to Kao Corporation, Tokyo and Kawasaki Steel Corporation, Kobe, both of, Japan

Filed Jul. 20, 1984, Ser. No. 632,665

Claims priority, application Japan, Jul. 22, 1983, 58-132793; Jul. 22, 1983, 58-132794

Int. Cl.[4] **C03C** *23/00;* **C23G** *1/02;* **C11D** *7/22*

U.S. Cl. 252—146 **14 Claims**

1. A metal cleaning composition comprising:

(A) a nonionic surface active agent or an anionic surface active agent having an HLB value ranging from 3 to 18, wherein said agent is contained in an amount of from 1 to 40 weight percent of the composition,

(B) a carboxylic acid or salt thereof represented by the following general formula

$$R—X'—(CH_2)_m—COOM$$

in which X represents >N—H, $>N(CH_2)_n—COOM$ or >CH—COOM, R represents a saturated or unsaturated aliphatic hydrocarbon group having from 4 to 18 carbon atoms, phenyl group or tolyl group; m and n are independently an integer from 1 to 3, and M represents a cation, wherein said carboxylic acid or a salt thereof is contained in an amount of from 1 to 50 weight percent of the composition, and

(C) a five-membered ring compound having either one nitrogen atom and one sulfur atom, or three nitrogen atoms, or a quinoline derivative having a hydroxyl group, wherein said five-membered ring compound or quinoline derivative is contained in an amount of from 0.05 to 2 weight percent of the composition,

wherein said composition is formulated to be soluble in aqueous solution.

4,595,520

METHOD FOR FORMING SOLID DETERGENT COMPOSITIONS

Bernard J. Heile, Apple Valley, and Terry J. Klos, Minnetonka, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Oct. 18, 1984, Ser. No. 663,473

Int. Cl.[4] **C11D** *7/56*

U.S. Cl. 252—160 **25 Claims**

1. A method for forming a solid alkaline detergent composition comprising forming an emulsion comprising water, a source of alkalinity comprising about 5–25% of an alkali metal hydroxide, a condensed phosphate hardness sequestering agent and a solidifying agent selected from the group consisting of anhydrous sodium carbonate, anhydrous sodium sulfate and mixtures thereof, said solidifying agent being being incorporated into said emulsion at about 35°–50° C., the amount of said agent being effective to solidify said emulsion to a homogeneous solid when it is cooled to ambient temperatures.

4,595,521

PYRIDAZINE DERIVATIVES USEFUL AS COMPONENTS OF LIQUID CRYSTAL MIXTURES

Martin Petrzilka, Kaiseraugst, Switzerland, and Georg Trickes, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 14, 1983, Ser. No. 551,655

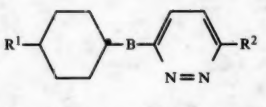
Claims priority, application Switzerland, Nov. 19, 1982, 6748/82; Jan. 14, 1983, 208/83; Sep. 21, 1983, 5132/83

Int. Cl.[4] **C09K** *3/34;* **G02F** *1/13;* **C07D** *237/02, 237/08*

U.S. Cl. 252—299.61 **16 Claims**

10. A liquid crystalline mixture comprising

(a) a compound of the formula



I

wherein B is —C≡C— or $—CH_2CH_2—$, R^1 is straight-chain C_1–C_{12}-alkyl and R^2 is straight-chain C_1–C_{12}-alkyl or straight-chain C_1–C_{12}-alkoxy; and

(b) a liquid crystalline carrier material.

4,595,522

AEROSOL PROPELLANTS OF MONOCHLORODIFLUOROMETHANE, DIMETHYLETHER AND BUTANE

Philip L. Bartlett; John J. Daly, Jr., and John D. Sterling, Jr., all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

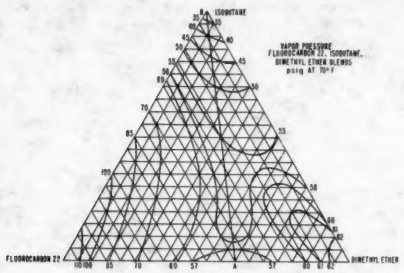
Filed Dec. 12, 1983, Ser. No. 560,727

Int. Cl.[4] **C09K** *3/30;* **C11D** *17/00;* **A61L** *9/04;* **A61K** *7/00*

U.S. Cl. 252—305 **9 Claims**

1. An aerosol propellant composition consisting essentially of monochlorodifluoromethane and dimethyl ether where the monochlorodifluoromethane to dimethylether weight ratio is

from 50:50 to 30:70, in admixture with a hydrocarbon selected from the group consisting of butane and isobutane and mixtures thereof said composition having a vapor pressure in the range of about 50–60 psig at 70° F.


ISOBUTANE
VAPOR PRESSURE FLUOROCARBON 22, ISOBUTANE, DIMETHYL ETHER BLENDS psig AT 70° F
FLUOROCARBON 22
DIMETHYL ETHER

4,595,523

CORROSION INHIBITION IN ENGINE FUEL SYSTEMS

J. Irvine Knepper; Robert J. Garrecht, and George W. Dear, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 1, 1983, Ser. No. 510,011
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—390 **23 Claims**

1. Corrosion inhibitor Composition consisting essentially of a mixture of a triazole and at least one amine salt of an acid.

4,595,524

TWO COMPONENT STAIN COMPOSITION FOR PRODUCING A GIEMSA BLOOD STAIN EFFECT

Kin F. Yip, and Frances F. Rhodes, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 28, 1984, Ser. No. 594,182
Int. Cl.[4] G01N *31/00, 1/00;* B66D *3/04*
U.S. Cl. 252—408.1 **6 Claims**

4. A method of staining a blood smear to enhance microscopic examination thereof which method comprises the steps of:

(a) contacting the blood smear with anhydrous methanol as fixative;

(b) preparing a fresh Giemsa stain solution by mixing:

i. a first component of an aqueous solution containing from 0.23 to 0.27% (w/v) of methylene blue together with 0.23 to 0.27% (w/v) Azure B and 0.015 to 0.025% (w/v) of a preservative; and

ii. a second component which is made up of a solvent system of 12 to 13% (v/v) acetone, 6 to 6.5% (v/v) dimethyl formamide and the remainder water which solvent system contains 0.07 to 0.08% (w/v) of the sodium salt of eosin Y and a buffer system which is a combination of 0.28 to 0.3% (w/v) monobasic potassium phosphate and 0.1 to 0.12 dibasic sodium phosphate wherein the volume ratio of the first component to the second component is from 1:3 to 1:5.

(c) applying the fresh Giemsa stain solution to the blood smear; and

(d) rinsing the blood smear with an aqueous solution of a buffer, a preservative and a surfactant.

4,595,525

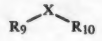
COMPOSITION AND PROCESS FOR AUGMENTING, ENHANCING OR IMPARTING A LEATHER AROMA TO CONSUMABLE MATERIALS

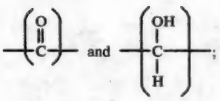
Braja D. Mookherjee, Holmdel, and Robert W. Trenkle, Bricktown, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,359
Int. Cl.[4] A61K *7/46*
U.S. Cl. 252—522 R **9 Claims**

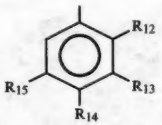
1. A mixture of chemicals having a pronounced leathery aroma consisting essentially of:

"A": At least one substance having the structure:



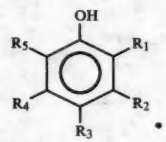


"B": At least one compound having the structure:



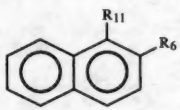
in an amount of from about 3 up to about 7% wherein each of R_{12}–R_{15} represents hydrogen or C_1–C_4 alkyl with the proviso that at least two of R_{12}–R_{15} represents hydrogen;

"C": At least one compound having the structure:



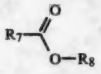
in an amount of from about 2% up to about 6% wherein R_1, R_2, R_3, R_4 and R_5 each represents hydrogen or C_1–C_4 alkyl with the proviso that one, two or three of R_1, R_2, R_3, R_4 and R_5 represents C_1–C_4 alkyl;

"D": Optionally, at least one compound having the structure:



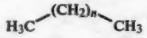
in an amount of from 0% up to about 1.2% wherein R_6 represents hydrogen or methyl and R_{11} represents hydrogen or methyl with the proviso that at least one of R_6 or R_{11} is hydrogen;

"E": At least one compound defined according to the structure:



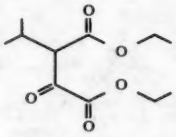
in an amount of from about 30% up to about 70% wherein R_7 represents C_{11}, C_{13}, or C_{15} straight-chain alkyl and R_8 represents C_1–C_3 lower alkyl;

"F": At least one compound having the structure:



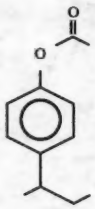
in an amount of from about 20% up to about 60% wherein n represents an integer of from 8 up to 28;

"G": Optionally, the compound having the structure:



in an amount of from 0 up to about 6%; and

"H": Optionally, the compound having the structure:



in an amount of from 0 up to about 6%

with the requirement that:

$$\Sigma[A + B + C + D + E + F + G + H]$$

equal 100%.

4,595,526

HIGH FOAMING NONIONIC SURFACANT BASED LIQUID DETERGENT

Kuo-Yann Lai, Plainsboro, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 28, 1984, Ser. No. 656,103
Int. Cl.[4] C11D *1/831, 1/84*
U.S. Cl. 252—545 **9 Claims**

1. A high foaming, nonionic surfactant-based, light duty, liquid detergent consisting essentially of, by weight, (A) 13% to 25% of a water soluble nonionic surfactant selected from the group consisting of primary and secondary C_8–C_{18} alkanol condensates with 5 to 30 moles of ethylene oxide, condensates of C_8–C_{18} alkylphenol with 5to 30 moles of ethylene oxide, condensates of C_8–C_{20} alkanol with a heteric mixture of ethylene oxide and propylene oxide having a weight ratio of ethylene oxide to propylene oxide from 2.5:1 to 4:1 and a total alkylene oxide content of 60% to 85% by weight and condensates of 2 to 30 moles of ethylene oxide with sorbitan mono- and tri- C_{10}–C_{20} alkanoic acid esters having an HLB of 8 to 15; (B) 2% to 8% of a water-soluble anionic detergent selected from the group consisting of C_8–C_{18} alkyl sulfates, C_8–C_{16} alkylbenzene sulfonates, C_{10}–C_{20} paraffin sulfonates, C_{10}–C_{24} alpha olefin sulfonates and C_8–C_{18} alkyl sulfosuccinate esters, C_8–C_{18} acyl isethionates and C_8–C_{18} acyl taurates; (C) 2% to 6% of a water-soluble C_8–C_{18} alkyl amidopropyl dimethyl betaine; (D) 2% to 6% of a C_{12}–C_{14} fatty acid monoethanolamide foam stabilizer; solubilized in (E) an aqueous medium; the sum of A-D being from 20% to 40% by weight of the composition, said nonionic surfactant being in excess of 50% by weight of said sum and said composition being free of anionic alkyl ether polyethenoxy sulfate detergent.

4,595,527

AQUEOUS LAUNDRY PRESPOTTING COMPOSITION

Mark M. Gipp, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 25, 1984, Ser. No. 653,865
Int. Cl.[4] C11D *1/40*
U.S. Cl. 252—546 **17 Claims**

1. A laundry pre-spotting composition consisting essentially of:

(a) from about 0.1 to 6% by weight of a chelating agent;

(b) from about 5 to 40% by weight of at least one nonionic surfactant selected from the group consisting of ethoxylated nonylphenols, ethoxylated octylphenols, ethoxylated secondary fatty alcohols, ethoxylated primary fatty alcohols, ethoxylated sorbitan fatty acid esters, sorbitan fatty acid esters, and mixtures thereof, wherein the surfactant has an HLB such that the combined HLB for all surfactants present is within the range of from 9 to 13; and

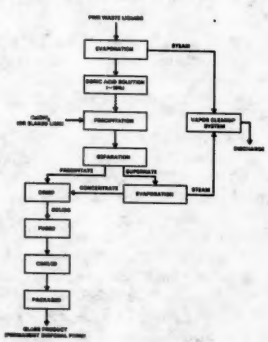
(c) water, wherein the composition has less than 1% by weight of an organic water immiscible and non-polar water insoluble solvent and wherein the composition has a pH within the range of from about 4.5 to 12.2.

4,595,528

PROCESS FOR IMMOBILIZING RADIOACTIVE BORIC ACID LIQUID WASTES

Wilbur O. Greenhalgh, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 10, 1984, Ser. No. 608,739
Int. Cl.[4] G21F *9/16;* **C04B** *35/00*
U.S. Cl. 252—629 **4 Claims**



1. A method for immobilizing radioactive boric acid waste solutions comprising: neutralizing a boric acid waste solution containing radionuclides with calcium hydroxide and forming a precipitate, evaporating said precipitate to near dryness, and firing said dry precipitate to form a calcium borate glass product containing said radionuclides.

4,595,529
SOLVENT WASH SOLUTION

James C. Neace, Blackville, S.C., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Mar. 13, 1984, Ser. No. 589,241
Int. Cl.[4] G21F *9/04;* B01D *11/00, 11/04*
U.S. Cl. 252—631 14 Claims

1. Process for removing diluent degradation products from a solvent extraction solution comprising an admixture of an organic extractant for uranium and plutonium and a non-polar organic liquid diluent, which has been used to recover uranium and plutonium from spent nuclear fuel, comprising:

combining a wash solution comprising:

(a) water; and

(b) a positive amount up to about, and including, 50 volume percent of at least one highly-polar water-miscible organic solvent, based on the total volume of said water and said highly-polar organic solvent, with said solvent extraction solution after uranium and plutonium values have been stripped from the solvent extraction solution, said diluent degradation products dissolving in said highly-polar organic solvent and said extractant and diluent of said extraction solution not dissolving in said highly-polar organic solvent, and

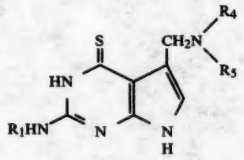
separating said highly-polar organic solvent and said extraction solution to obtain a purified extraction solution.

4,595,530
THIODEAZAPURINE DERIVATIVES

Susumu Nishimura, Chiba, and Hiroaki Nomura, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Doshomachi, Japan

Filed Mar. 16, 1984, Ser. No. 590,357
Claims priority, application Japan, Mar. 17, 1983, 58-45725
Int. Cl.[4] C07D *223/04, 225/02, 487/04*
U.S. Cl. 260—239 B 17 Claims

1. A 7-deazapurine compound of the formula:



wherein

R_1 is a hydrogen atom, an alkanoyl group of up to 18 carbon atoms, benzoyl, toluoyl or naphthoyl group and

R_4 and R_5 each is a hydrogen atom or a hydrocarbon residue of the class consisting of C_{1-18}-alkyl, C_{2-12}-alkenyl, C_{3-12}-cycloalkyl, C_{3-8}-cycloalkenyl, benzyl, α-methylbenzyl, phenethyl, diphenylmethyl, phenyl and naphthyl residues, which hydrocarbon radicals may optionally be mono-, di- or tri-substituted with C_{1-4}-alkyl, C_{1-4}-alkoxy, hydroxy-C_{1-4}-alkoxy, C_{1-4}-alkanoyl, C_{1-4}-alkanoyloxy, C_{2-4}-alkoxycarbonyl, halo, hydroxy, nitro, cyano, trifluoromethyl, amino, C_{1-4}-monoalkylamino, carboxymethylamino, di-(C_{1-4}-alkyl)amino, dicarboxymethylamino and C_{1-4}-alkanoylamino groups

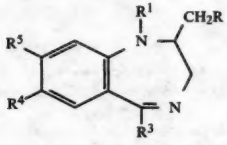
or wherein R_4 and R_5, together with the adjacent nitrogen atom, form a cyclic amino group of the class consisting of azetidinyl, pyrrolidinyl, pyrrolinyl, pyrrolyl, imidazolyl, pyrazolyl, imidazolinyl, piperidino, morpholino, dihydropyridyl, tetrahydropyridyl, N-methylpiperazinyl, N-ethylpiperazinyl, azacycloheptyl, azacyclooctyl, isoindolyl, indolyl, indolinyl, 2-isoindolinyl, azacyclononyl and azacyclodecyl groups and pharmaceutically acceptable salts thereof.

4,595,531
PROCESS OF MAKING BENZODIAZEPINE DERIVATIVES

Wolfgang Milkowski, Burgdorf; Renke Budden, Peine; Siegfried Funke, Hanover; Rolf Hüschens, Laatzen; Hans-Günther Liepmann, Hanover; Werner Stühmer, Eldagsen, and Horst Zeugner, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 598,880, Jul. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 359,989, May 1, 1973, abandoned. This application Apr. 24, 1984, Ser. No. 602,279
Claims priority, application Fed. Rep. of Germany, May 3, 1972, 2215583
Int. Cl.[4] C07D *243/14, 401/06, 403/06, 413/06*
U.S. Cl. 260—239 BD 20 Claims

1. A process of making benzodiazepine derivatives of the formula



wherein

R represents halogen, hydroxy, lower alkoxy or an amino group corresponding to the formula

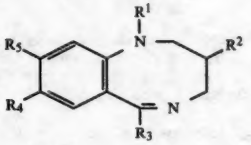
wherein R^6 and R^7 may be the same or different and are selected from hydrogen, lower alkyl or benzyl, or R^6 and R^7 together form a piperidino group;

R^1 represents hydrogen or lower alkyl;

R^3 represents phenyl or phenyl substituted at least once with a group selected from halogen, nitro, trifluoromethyl, lower alkyl and lower alkoxy;

R^4 represents hydrogen, halogen, nitro, trifluoromethyl, lower alkyl or lower alkoxy; and

R^5 is hydrogen, or a pharmaceutically acceptable acid addition salt thereof, said process comprising subjecting a benzodiazocine corresponding to the formula



or an acid addition salt thereof wherein R^1, R^3, R^4 and R^5 have the same meanings as above and R^2 represents (i) halogen or (ii) hydroxy, in the case of (i) to thermal treatment in an inert solvent in the presence of a nucleophilic agent which produces a hydroxy, lower alkoxy or amino residue

wherein R^6 and R^7 have the same meanings as above, or in

the case of (ii) to thermal treatment with a halogenating Lewis acid in a solvent.

4,595,532

N-(SUBSTITUTED-METHYL)-AZETIDIN-2-ONES

Marvin J. Miller, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Continuation of Ser. No. 463,101, Feb. 2, 1983, abandoned. This application Apr. 1, 1985, Ser. No. 718,127

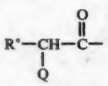
Int. Cl.[4] C07D *205/08, 413/04, 403/04, 401/12*

U.S. Cl. 260—239 A **18 Claims**

1. A compound of the formula

wherein

R is hydrogen, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_1–C_4 alkyl mono-substituted by hydroxy, C_1–C_4 alkoxy, halogen, amino, protected-amino, carboxy, or protected carboxy; or R is amino, or protected amino wherein the protecting group is C_1–C_5 alkanoyl, C_1–C_5 alkanoyl mono-substituted by halogen, cyano, or hydroxy; an arylacetyl or heteroarylacetyl group of the formula



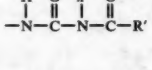
wherein

R° is thienyl, benzothienyl, furyl, benzofuryl, thiazolyl, oxazolyl, isoxazolyl, isothiazolyl, pyrazolyl, thiadiazolyl, oxadiazolyl, pyridyl, and said heterocyclic rings mono-substituted by C_1–C_4 alkyl, amino, protected amino, or hydroxy; cyclohexadienyl, naphthyl, phenyl, or a substituted phenyl group of the formula

wherein

a and a′ independently are hydrogen, halogen, hydroxy, C_1-C_4 alkyl, C_1-C_4 alkoxy, amino, aminomethyl, methylsulfonylamino, hydroxymethyl, trifluoromethyl, carboxy, protected carboxy, carboxymethyl, or protected carboxymethyl;

Q is hydrogen, hydroxy, C_1–C_4 alkanoyloxy, carboxy, protected carboxy, sulfo (—SO_3H), amino, protected amino, or a substituted amino group of the formula

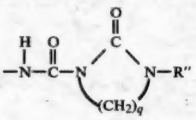


wherein

x is hydrogen or C_1–C_3 alkyl; R′ is furyl, thienyl, phenyl, halophenyl, nitrophenyl, styryl, halostyryl, nitrostyryl, or a group of the formula

wherein

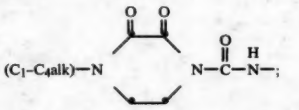
y is hydrogen or C_1–C_3 alkyl; R″ is hydrogen, C_1–C_4 alkyl, benzyl, C_2–C_5 alkanoyl, or C_1–C_3 alkylsulfonyl; and when R′ is —N(y)R″ x and y may be taken together with the —N—C(O)—N—R″ group to which they are bonded to form a 5- or 6-membered ring-containing group of the formula



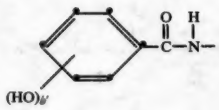
wherein

R″ has the same meanings as defined hereinabove and q is 2 or 3;

or Q is a substituted amino group of the formula



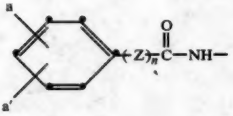
or Q is a benzamido group of the formula



wherein

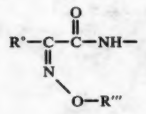
b′ is an integer of 1–3;

or R is an acylamino group of the formula



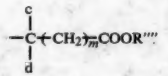
wherein

a and a′ have the same meanings as defined above, Z is O or S, and n is 0 or 1; or an oximino-substituted acylamino group of the formula



wherein

R° is as defined above, and R‴ is hydrogen, C_1–C_4 alkyl, or a carboxy-substituted alkyl or carboxy-substituted cycloalkyl group of the formula



wherein

m is 0 to 3, and c and d when taken separately are indepen-

dently hydrogen or C_1–C_3 alkyl, and when taken together with the carbon atom to which they are bonded form a 3- to 6-membered carbocyclic ring; and R'''' is hydrogen, or a carboxy-protecting ester group;

R_1 is hydrogen, hydroxy, C_1–C_4 alkoxy, halogen, or C_1–C_4 alkyl;

R_2 is hydrogen;

Y is a substituted methyl group of the formula

wherein

R_3 is protected carboxy; and

R_4 is hydrogen, or a carboxy-protecting group.

4,595,533

METHOD FOR PRODUCING N-ORGANOCARBAMATES AND N,N-BIS(ORGANO)CARBAMATES

Ralph B. Thompson, Oakbrook, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

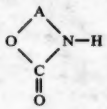
Filed Sep. 23, 1982, Ser. No. 422,235

Int. Cl.[4] C07D *267/06, 265/06*

U.S. Cl. 260—239.3 R **27 Claims**

1. A method comprising reacting a first ester of a carbamic acid containing at least one hydrogen atom attached to the carbamic nitrogen atom thereof, with organic carbonate to produce a second ester of a carbamic acid having a greater degree of organic substitution on the carbamic nitrogen atom thereof than said first ester.

23. The method of claim **1** wherein said first ester is represented by the formula



wherein A is a bivalent organo group.

4,595,534

PROCESS FOR THE PRODUCTION OF URETDIONE GROUP-CONTAINING POLYISOCYANATES

Hans-Joachim Scholl, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 21, 1985, Ser. No. 736,572

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420114

Int. Cl.[4] C07D *499/00*

U.S. Cl. 260—239 A **8 Claims**

1. A process for the production of a uretdione group-containing polyisocyanate having aliphatically- and/or cycloaliphatically-bound isocyanate groups which comprises dimerizing a portion of the isocyanate groups of an organic diisocyanate having aliphatically- and/or cycloalphatically-bound isocyanate groups in the presence of antimony(V)fluoride and terminating the dimerization reaction when the desired degree of dimerization has been reached by the addition of a catalyst poison or by the removal of antimony(V)fluoride by distillation.

4,595,535

DIAZACYCLOALKYL-1,2,4-TRIAZOLO[2,3-C][1,3]BENZODIAZEPINES USEFUL AS NEUROLEPTIC AND/OR ANTIHISTAMINIC AGENTS

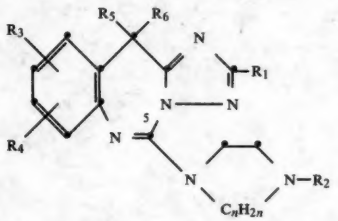
Isidoros Vlattas, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 501,328, Jun. 6, 1983, abandoned. This application Aug. 22, 1984, Ser. No. 643,136

Int. Cl.[4] C07D *487/16;* **A61K** *31/495*

U.S. Cl. 260—243.3 **11 Claims**

1. A compound of the formula



(I)

wherein R_1 is hydrogen, lower alkylthio, amino, (lower alkanoyl, mono- or di-lower alkyl)-amino, lower alkoxy, lower alkanoyloxy, lower alkyl, lower alkanoyl, hydroxy, halogen, trifluoromethyl, cyano, carboxy, lower alkoxycarbonyl, carbamoyl, mono- or di-lower alkyl-carbamoyl, hydroxy-lower alkyl or di-lower alkylamino-lower alkyl; C_nH_{2n} is C_2–C_4-alkylene separating both nitrogen atoms by 2 or 3 carbon atoms thus forming with both adjacent nitrogen atoms a piperazinyl of homopiperazinyl moiety; R_2 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, lower alkanoyl, aryl-lower alkyl, lower alkoxycarbonyl, lower phenylalkoxycarbonyl or (hydroxy, lower alkanoyloxy, aryloxy or lower alkoxy)-C_2–C_7-alkyl; R_3 and R_4 independently represent hydrogen, lower alkyl, lower alkoxy, lower alkylthio, halogen, trifluoromethyl, hydroxy, lower alkanoyloxy, sulfamoyl, mono- or di-lower alkylsulfamoyl; and R_5 and R_6 represent hydrogen or lower alkyl; and wherein within the above definitions aryl represents phenyl or phenyl substituted by halogen, lower alkoxy or lower alkyl; an N-oxide; or a pharmaceuticaly acceptable salt thereof.

10. A method for the treatment or management of aggression, agitation, schizophrenia which comprises administering enterally or parenterally to a mammal suffering therefrom a pharmaceutical composition comprising an effective amount of a compound of claim **1** in combination with one or more pharmaceutical carriers.

4,595,536

TRIPHENYLMETHANE DYESTUFF

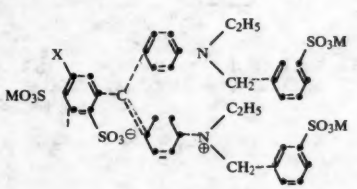
William M. Hung, and Jack M. Knox, both of Cincinnati, Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 560,000, Dec. 9, 1983, Pat. No. 4,536,368. This application May 13, 1985, Ser. No. 732,989

Int. Cl.[4] C09B *11/10*

U.S. Cl. 260—394 **3 Claims**

1. A triphenylmethane compound having the structural formula



in which:

M represents an alkali metal cation, an ammonium ion or an alkaline earth metal cation; and

X represents hydrogen or hydroxy.

4,595,537

POLYGLYCEROL COMPOUNDS AND COSMETIC PRODUCTS CONTAINING THE SAME

Michio Ochiai, and Hiromichi Sagitani, both of Kanagawa, Japan, assignors to Pola Chemical Industries, Inc., Japan

Continuation of Ser. No. 481,322, Mar. 31, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 750,231

Claims priority, application Japan, Apr. 13, 1982, 57-61264

Int. Cl.[4] C07C *43/10, 43/14*

U.S. Cl. 260—410.6 **4 Claims**

1. A polyglycerol compound expressed by the following Formula (I) or (II):

$$R_1O(X_1)m_1—Y_1—_{n1}H \quad (I)$$

wherein R_1 is a straight-chain or branched saturated or unsaturated aliphatic alcohol residue having carbon atoms of 8–36, X_1 is $CH_2CH_2CH_2O$ and/or $CH_2CH_2CH_2CH_2O$, Y_1 is a glycerol residue, X_1 and Y_1 are randomly arranged, m_1 equals 3–60, and n_1 equals 4–60, or

$$R_2COO(X_2)m_2—Y_2—_{n2}H \quad (II)$$

wherein R_2 is a straight-chain or branched, saturated or unsaturated fatty acid residue having carbon atoms of 7–35, X_2 is $CH_2CH_2CH_2O$ and/or $CH_2CH_2CH_2CH_2O$, Y_2 is a glycerol group, X_2 and Y_2 are randomly arranged, m_2 equals 3–60, and n_2 equals 4–60.

4,595,538

TRI-ALKALI METAL-DI(CARBOXYALKYL)DITHIOCARBAMATE AND TRIAMMONIUM-DI(CARBOXYALKYL)DITHIOCARBAMATE FLOTATION AGENTS

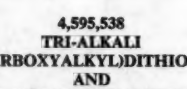
Kenneth B. Kimble; Clarence R. Bresson, and Harold W. Mark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1985, Ser. No. 708,130

Int. Cl.[4] C07C *155/06;* C22B *1/00*

U.S. Cl. 260—502.56 **10 Claims**

1. The composition represented by the formula



wherein R and R′ are each selected from the group consisting of alkylene radicals each having from 1 to 12 carbon atoms and can be the same or different; and wherein M is selected from the group consisting of alkali metal atoms and ammonium.

4,595,539

PREPARATION OF PENEM DERIVATIVES AND AZETIDINONE INTERMEDIATES

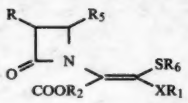
Ernest S. Hamanaka, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 502,894

Int. Cl.[4] C07D *205/08, 498/04, 403/12, 401/12*

U.S. Cl. 260—239 A **10 Claims**

1. A compound of the formula



wherein

R is hydrogen, 1-hydroxyalkyl having 1 or 2 carbon atoms or wherein the 1-hydroxyalkyl is substituted with a hydroxyl-protecting group selected from the group consisting of benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl and trialkylsilyl wherein each alkyl has 1–6 carbon atoms;

R_1 is (alk)-G, (alk)-G_1, G_1 or $CH(G_2)_2$ wherein (alk) is an alkyl group having one to four carbon atoms;

G is hydrogen, alkoxy having one to five carbon atoms, 2-(alkoxy)ethoxy having three to seven carbon atoms, alkylthio having one to five carbon atoms, phenoxy, thiophenoxy, amino, amino substituted with an amine-protecting group wherein said group is benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl or together with the amine nitrogen being protected azido; N-phenyl-N-alkylamino wherein the alkyl has one to four carbon atoms, N-alkanoylamino having two to six carbon atoms, N-alkoxyalkanoyl)amino having three to ten carbon atoms, 2-(N-alkanoylamino)ethoxy having four to eight carbon atoms, aminocarbonyl, aminocarbonyloxy, N-alkylaminocarbonylamino having two to five carbon atoms, N-alkanoylaminoacetylamino having four to seven carbon atoms, N-alkylaminocarbonyloxy, aminocarbonylalkoxy having two to five carbon atoms, N-alkylaminocarbonyl having two to five carbon atoms, N-(alkoxyalkyl-)aminocarbonyl having three to nine carbon atoms;

G_1 is azetidinyl or azetidinyl substituted with N-alkanoyl having two to six carbon atoms or an amine-protecting group wherein said group is benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl or together with the amine nitrogen being protected azido; a five- or six-membered ring which is carbocyclic or heterocyclic having one or two oxygen atoms, one, two, three or four nitrogen atoms, a sulfur atom, a nitrogen atom and an oxygen atom or a nitrogen atom and a sulfur atom, or said five- or six-membered ring substituted with alkyl having one to four carbon atoms, dialkyl each having one to four carbon atoms, oxo, amino, amino substituted with an amine-protecting group wherein said group is benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl or together with the amine nitrogen being protected azido, alkoxycarbonyl having two to five carbon atoms, di(alkoxycarbonyl) each having two to five carbon atoms, N-alkylamino-carbonyl having two to five carbon atoms, alkoxyalkyl having two to seven carbon atoms, phenyl, formyl, aminocarbonyl, N-alkylaminocarbonylamino having two to five carbon atoms, alkanoylamino having two to five carbon atoms, alkoxy having one to four carbon atoms or phenoxyacetyl; and

G_2 is alkanoylaminomethyl each having three to seven carbon atoms or alkoxy each having one to four carbon atoms;

R_2 is hydrogen, a group which forms an ester which is hydrolyzed in vivo or a carboxylic acid protecting group selected from the group consisting of benzyl, p-nitrobenzyl, allyl and 2,2,2-trichloroethyl;

R_5 is chloro, bromo or iodo;

R_6 is a sulfur-protecting group selected from alkanoyl having from 2–8 carbon atoms, optionally substituted with alkoxy having from 1–4 carbon atoms, phenyl, pyridyl or 2-benzothiazolyl;

X is oxygen or sulfur; and

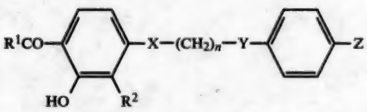
i is zero or 1.

4,595,540
BENZONITRILE AND BENZOTHIOCYANO INTERMEDIATES

John Goldsworthy, Bracknell, England; Winston S. Marshall, Bargersville, Ind., and John P. Verge, Henley-on-Thames, England, assignors to Lilly Industries Limited, London, England

Filed Oct. 19, 1983, Ser. No. 543,196
Claims priority, application United Kingdom, Oct. 21, 1982, 8230076
Int. Cl.⁴ C07C *121/76, 161/02*
U.S. Cl. 558—414 **4 Claims**

1. A compound of the formula



in which R^1 is hydrogen or C_{1-6} alkyl, R^2 is hydrogen, C_{1-6} alkyl or C_{3-6} alkenyl, X and Y are each oxygen, sulphur, sulphinyl or sulphonyl, n is 2 to 6 and z is cyano or thiocyano provided that when X and Y are oxygen z is thiocyano.

4,595,541
PROCESS FOR THE PREPARATION OF TRIFLUOROACETIC ANHYDRIDE

Louis Amiet, and Camille Disdier, both of Lyons, France, assignors to Rhone Poulenc Specialties Chimiques, France

Filed Jun. 5, 1985, Ser. No. 741,630
Claims priority, application France, Jun. 13, 1984, 84 09188
Int. Cl.⁴ C07C *51/56*
U.S. Cl. 260—546 **16 Claims**

1. A process for the preparation of trifluoroacetic anhydride which comprises reacting trifluoroacetic acid with the anhydride of an α-halogenated acid for a time sufficient to obtain said trifluoroacetic anhydride, wherein the α-halogenated acid anhydride corresponds to formula (I):

$$[Y_1(CY_2Y_3)_n\text{—}CO]_2O \qquad (I)$$

in which

Y_1, Y_2 and Y_3 may be identical or different and are selected from chlorine, bromine and hydrogen;

n is an integer equal to 1 or 2; and,

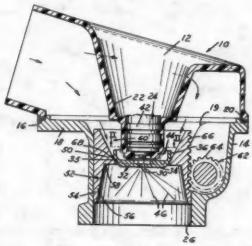
at least one Y situated at a position α to the CO group is chlorine or bromine.

4,595,542
AIR ATOMIZING THROTTLE BODY

James H. Jones, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1985, Ser. No. 689,106
Int. Cl.⁴ F02M *69/04*
U.S. Cl. 261—53 **1 Claim**

1. A central fuel injection type fuel feed system for an automotive type internal combustion engine including an air/fuel throttle body having an air/fuel passage therethrough open at one end to air essentially at an atmospheric pressure level and adapted to be connected at its opposite end to the intake manifold of the engine to subject the passage to the varying vacuum levels therein, a fuel injector means concentrically positioned in the passage for discharge of fuel thereinto in a longitudinal direction with a conical-like spray pattern, and an axially movable sleeve type throttling valve for variably controlling the flow of air into the passage for mixture with the fuel sprayed therein, the valve and injector means together defining a variable area convergent-divergent air flow area between, the sleeve valve including a sleeve and annular air throttling means projecting radially inwardly of the sleeve and tapering progressively inwardly in an axial direction towards the intake manifold end of the throttle body, the fuel injection means including a cup-shaped member having an angled side wall portion cooperating with the throttling means to define the path varying in area as a function of the axial movement of the sleeve valve, the cup-shaped member including a plurality of

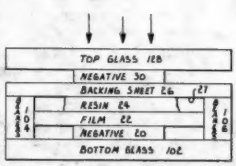


circumferentially spaced air swirl slots directing the air radially inwardly towards the fuel injector means for mixture of the air with fuel discharged from the injector means for atomization thereof, the sleeve being formed with a second annular diffuser-like means contiguous to and downstream of the first mentioned ramplike means and diverging radially outwardly in an axial direction towards the intake manifold end of the passage, the junction between the ramp and diffuser-like means constituting a step providing a large pressure differential to the air flowing between the two.

4,595,543
METHOD OF FORMING PHOTOPOLYMERIC MOLDING PATTERN

Ray D. Williams, 1519 Atlantic, North Kansas City, Mo. 64116

Filed May 25, 1984, Ser. No. 614,053
Int. Cl.⁴ B29C *35/08*
U.S. Cl. 264—22 **35 Claims**



1. A method of making an impression pattern comprising the steps of:

(a) providing a first image negative with said negative having an image area thereon allowing for passage of certain light waves therethrough;

(b) positioning a resin sensitive to said certain light waves adjacent said first negative;

(c) placing a backing sheet over said resin;

(d) passing said certain light waves through said backing sheet for a first selected time period to harden a layer of said resin adjacent said backing sheet whereby to bond said backing sheet to said resin;

(e) passing said certain light waves through said first image negative and onto said resin for a second selected time period, said certain light waves passing through said image portion of said first negative and into said resin in a

manner to harden the portion of said resin adjacent said image area on said negative;

(f) providing a second image negative, said second negative having an image area thereon allowing for passage of said certain light waves therethrough;

(g) placing said second image negative over said backing sheet and in alignment with said first image negative;

(h) passing said certain light waves through said second image negative and said backing sheet and onto said resin for a third selected time period, said certain light waves passing through said image area of said second negative and into said resin in a manner to harden said resin adjacent said image area of said second negative; and

(i) removing the non-hardened portions of said resin whereby to present a pattern comprising said backing sheet and having first and second portions of said hardened resinous material projecting therefrom, said respective portions having configurations corresponding to said images on said respective first and second negatives.

4,595,544

METHOD OF MANUFACTURING A CONTAINER COVERED WITH PROTECTIVE SHEET

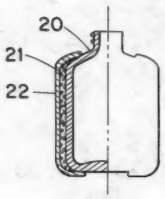
Hisao Maruyama, Toyonaka; Masahiko Kitajima, Izumi, and Tsutomu Matsubara, Nishinomiya, all of Japan, assignors to Fuji Seal Industry Co., Osaka and Yamamura Glass Kabushiki Kaisha, Hyogo, both of, Japan

Filed Apr. 27, 1984, Ser. No. 604,914

Claims priority, application Japan, Apr. 30, 1983, 58-77000

Int. Cl.[4] B29C *61/02, 63/42*

U.S. Cl. 264—46.5 **4 Claims**



1. A method for manufacturing a container covered with a protective sheet, comprising mechanically mixing a resin in the presence of a gas in order to entrap the gas and form a multiplicity of gas cells within the resin, hardening said resin having gas cells therein to form a foamed resin film which does not shrink when exposed to subsequent heat treatment, placing the non-shrinkable mechanically foamed resin film on an outer surface of the container, placing a protective sheet which undergoes shrinking during the subsequent heat treatment over the foamed resin film and contracting said heat shrinkable protective sheet by the heat treatment to cover the foamed resin film and the container tightly.

4,595,545

REFRACTORY METAL BORIDES AND COMPOSITES CONTAINING THEM

Ajit Y. Sane, Willoughby, Ohio, assignor to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Dec. 30, 1982, Ser. No. 454,718

Int. Cl.[4] C22C *29/14*

U.S. Cl. 264—65 **13 Claims**

1. The method of producing titanium diboride or a mixture thereof with a carbide and/or a nitride of the Group IVb, Vb, or VIb metals, comprising:

(a) preparing a solution of organic compounds comprising alkoxides of titanium and boron wherein the Ti:B molar ratio is at least about 1:2;

(b) mixing particulate carbon or a carbon precursor in said solution in an amount to provide a Ti:B:C molar ratio or about 1:2:5;

(c) hydrolyzing and gelling the solution to produce a glass or microcrystalline gell of an amorphous or microcrystalline oxide having a grain size up to 200 A and containing particulate carbon up to 500 A;

(d) grinding said glass or microcrystalline gel to form a resulting material, optionally adjusting the Ti:B:C molar ratio of the resulting material, and pressing the resulting material into a body; and

(e) heating the body to reaction temperature under vacuum, an inert atmosphere or nitrogen.

4,595,546

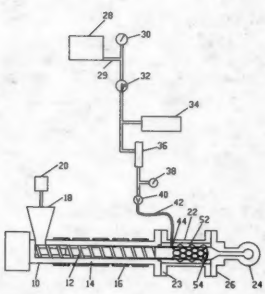
MANUFACTURE OF ELONGATED EXTRUDED CROSS-LINKED PRODUCTS

John R. Wheeler, Jr., Mystic, Conn., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,749

Int. Cl.[4] B29C *47/50*

U.S. Cl. 264—83 **5 Claims**



1. The method of making a cross-linked extruded elongated product comprising:

(a) metering into the hopper of a screw extruder which has a barrel and a screw extending from end to end of the barrel, a polymer capable of being cross-linked by the use of a liquid silane compound which comprises a modified vinyl functional silane, a free-radical generator, and a condensation catalyst;

(b) conveying the polymer through the barrel of the extruder;

(c) heating and melting while conveying the polymer through the barrel of the screw extruder;

(d) metering and injecting a liquid silane compound comprising a modified vinyl functional silane, a free-radical generator, and a condensation catalyst into the melted polymer;

(e) mixing and blending said silane compound and said melted polymer to obtain a uniform blended mixture thereof;

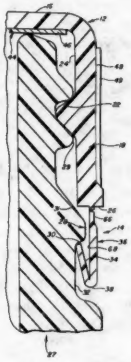
(f) extruding said blended mixture through an extrusion die to form an elongated product of a required final shape; and

(g) subjecting said elongated product to the action of moisture until said polymer is cross-linked.

4,595,547
METHOD OF MANUFACTURING A TAMPER EVIDENT CLOSURE

James E. Herr, East Petersburg, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Division of Ser. No. 467,873, Feb. 18, 1983, Pat. No. 4,506,795.
This application Jan. 25, 1985, Ser. No. 695,207
Int. Cl.[4] B29C *53/02*
U.S. Cl. 264—154 3 Claims



1. A method of manufacturing a tamper-evident closure which includes an internally threaded cap and tamper-indicating means including an indicator ring detachably connected to the cap and a plurality of tabs bent upward and radially inward from the ring for engaging an external annular shoulder on a container, the method comprising the steps of:

molding a blank having an internally threaded cap and generally cylindrical ring formed below the cap with a plurality of tabs extending downward from the ring and in substantial axial alignment from the ring so that the tabs need not be permanently bent to remove the same from the mold and with the ends of the tabs extending below the ring,

bending the tabs upwardly and inwardly from their molded straight down positions to an upward position and applying heat to the tabs at the location of their juncture with ring to form folded joints by destroying the memory of the plastic at the folded joints while the tabs are bent upwardly and inwardly about their folded joints, and

releasing the bending force which was maintaining the tabs with an upward and inward inclination to allow the tabs to assume a position intermediate their molded position and their upward position.

4,595,548
PROCESS FOR PREPARING ESSENTIALLY COLORLESS POLYIMIDE FILM CONTAINING PHENOXY-LINKED DIAMINES

Anne K. St. Clair, and Terry L. St. Clair, both of Poquoson, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 23, 1984, Ser. No. 643,524
Int. Cl.[4] B29D *7/24*
U.S. Cl. 264—236 17 Claims

1. A method for preparing a high temperature stable, highly optically transparent-to-colorless aromatic polyimide film comprising:

chemically reacting equimolar quantities of

(1) a highly purified aromatic diamine, and

(2) a highly purified aromatic dianhydride in a solvent medium to form a high molecular weight polyamic acid solution,

at least one of the reacted diamine and the dianhydride containing a separator linking group in the monomer molecular structure,

said separator linking group containing at least one phenoxy or thiophenyl unit,

said highly purified aromatic diamine being selected from the group consisting of o,p'- and m,m-oriented aromatic diamines,

said highly purified aromatic dianhydride being selected from the group consisting of 2,2-bis(3,4-dicarboxyphenyl)hexafluoropropane dianhydride, 4,4'-oxydiphthalic anhydride, and 4,4'-bis(3,4-dicarboxyphenoxy)diphenyl sulfide dianhydride,

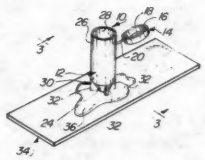
applying a controlled thickness film layer of the polyamic acid solution onto a surface, and

thermally curing the applied film layer in the temperature range of 250° C. to 300° C. for at least one hour to yield the optically transparent polyimide film layer.

4,595,549
CAPSULE AND CLAMPING APPARATUS FOR LOCATING AND EMBEDDING A SPECIMEN AND A METHOD FOR USING THE SAME

Tohru Inouye, and Lai-Chun J. Tong, both Chicago, Ill., assignors to Syprocode, Inc., Chicago, Ill.

Filed May 2, 1985, Ser. No. 729,950
Int. Cl.[4] B29C *1/00*
U.S. Cl. 264—267 28 Claims

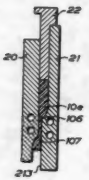


1. An improved embedding apparatus for embedding a specimen or the like from a microscope slide or the like into a block, comprising a capsule having a generally hollow elongated body with a longitudinal axis adopted to be aligned with the axis of the microtome machine, said capsule having a filling end and a specimen end, a preformed opening in said capsule at said specimen end, said preformed opening being adapted to be placed over a target specimen area on the slide or the like, said preformed opening having margins for sealing around the target area, means on said capsule for holding said capsule perpendicular to the slide or the like, and means for clamping said capsule perpendicular to the slide or the like with said margins on said specimen end in sealing contact with the slide or the like, said filling end of said capsule being adapted to receive embedding material or the like for embedding the specimen; whereby said preformed opening may be located over the desired target specimen, said capsule then being clamped in place perpendicular to the slide or the like, and embedding material poured into said capsule to form an embedded specimen block.

4,595,550
METHOD FOR THE CRYSTALLIZATION OF THERMOPLASTIC MATERIAL

Kjell M. Jakobsen, Skanör, and Torsten Nilsson, Löddeköping, both of Sweden, assignors to PLM AB, Malmö , Sweden

Filed Oct. 13, 1983, Ser. No. 541,520
Claims priority, application Sweden, Oct. 14, 1982, 8205829
Int. Cl.[4] B29C *55/22*
U.S. Cl. 264—292 10 Claims



1. A method of forming a preform having crystallized thermoplastic material from a blank of orientable thermoplastic material, said method comprising:

providing an elongated blank of orientable thermoplastic material having a given length and thickness, said blank having opposite outer surfaces,

positioning first and second mold parts at the opposite outer surfaces of the blank, the mold parts being relatively movable lengthwise of the blank,

said mold parts each having first and second contact surfaces at different levels with a step joining the contact surfaces and forming a transitional surface between said contact surfaces, the mold parts being positioned with the first surfaces thereof on the outer surfaces of the blank and with said transitional surfaces facing one another,

relatively moving the mold parts lengthwise of the blank to cause said transitional surfaces to approach one another and cause said blank to be laterally displaced over the steps and be engaged by said transitional surfaces over a portion of the thickness of the blank at respective engagement surfaces,

continuing the relative movement of said mold parts such that said transitional surfaces pass one another and travel longitudinally away from one another and cause the material of the blank to be reduced in thickness in an intermediate region in the blank between said engagement surfaces while said intermediate region concurrently is increased in length, said thickness being reduced to a value which the material would obtain if freely stretched to flow, thereby to achieve crystallization of the material in said intermediate region,

said old parts, at said engagement surfaces, forming transitional zones between the oriented material of said intermediate region and remaining orientable material of the blank in two end regions respectively extending lengthwise from said intermediate region at opposite ends thereof,

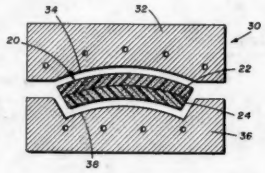
one of said transitional zones being moved lengthwise of the blank during the relative movement of the mold parts while orientable material of the blank passes through said one transitional zone to said intermediate region from the end region associated with said one transitional zone,

whereby orientation of material is produced in said intermediate region by longitudinal travel of said one transitional zone and flow of material through said one transitional zone from said end region associated with said one transitional zone.

4,595,551
THERMOFORMING OF STYRENIC FOAM LAMINATES

Richard P. Maurer, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 21, 1984, Ser. No. 653,658
Int. Cl.[4] B29C *67/22, 51/14, 51/42*
U.S. Cl. 264—321 14 Claims



1. A method of thermoforming a laminate of at least one layer of styrenic foam, said laminate having an outer layer of polyurethane foam adhered to the at least one layer of styrenic foam, said method comprising:

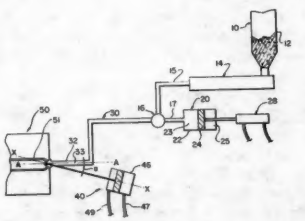
(a) heating said laminate to at least the thermoforming temperature of said styrenic foam, said temperature being at least about 100° C. at the interface of said styrenic foam and said outer layer of polyurethane foam and less than the temperature at which said polyurethane foam degrades, and

(b) thermoforming said laminate.

4,595,552
INJECTION MOLD GATE APPARATUS

Roger A. Hahn, Arvada, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Dec. 13, 1984, Ser. No. 681,099
Int. Cl.[4] B29F *1/022*
U.S. Cl. 264—328.1 12 Claims



1. An injection mold apparatus for forming elongate polystyrene parisons for carbonated beverage containers which are relatively free of weld lines comprising:

(a) polymer supply means for providing a supply of high pressure, high viscosity molten polystrene polymer;

(b) mold cavity means for receiving molten polymer therein for forming a polystyrene parison;

(c) conduit means positioned between said polymer supply means and said mold cavity means for providing a selectively interruptable flow polymer therebetween;

(d) injection means operatively associated with said conduit means for receivingly accepting polymer from said conduit means in a charging mode, and for injectingly discharging polymer in a discharging mode to provide an injection polymer flow through a portion of said conduit means to said mold cavity means;

(e) gate valve means operatively associated with said conduit means for selectively permitting or preventing fluid communication between said conduit means and said mold cavity means;

said gate valve means comprising:

(i) elongate passage means for directing a fluid flow of polymer therethrough, having a central longitudinal axis and terminating in an outlet orifice means;

(ii) needle means having a central longitudinal axis positioned in intersecting nonparallel relationship with said central longitudinal axis of said elongate passage means; said needle means having a terminal tip portion and being selectively movable between a closed state wherein said needle tip portion is positioned in sealing relationship in said orifice means whereby fluid flow therethrough is prevented, and an open state wherein said needle means is withdrawn from said elongate passage means whereby unrestricted fluid flow through said passage means is provided whereby weld line formation from flow obstruction is prevented.

12. A method of controlling the flow of liquid polymer to prevent formation of weld lines in a parison formed by an injection molding apparatus having polymer supply means for providing a supply of high pressure, high viscosity molten polymer; mold cavity means for receiving molten polymer therein for forming a polystyrene parison, conduit means positioned between said polymer supply means and said mold cavity means for providing a selectively interruptable flow of polymer therebetween; injection means operatively associated with said conduit means for receivingly accepting polymer from said conduit means in a charging mode, and for injectingly discharging polymer in a discharging mode to provide an injection polymer flow through a portion of said conduit means to said mold cavity means; and gate valve means operatively associated with said conduit mean for selectively permitting or preventing fluid communication between said conduit means and said mold cavity means; said gate valve means comprising elongate passage means for directing a fluid flow of polymer therethrough, having a central longitudinal axis and terminating in an outlet orifice; and having needle means for opening and closing said outlet orifice comprising the steps of:

(a) totally withdrawing said needle means from said elongate cavity means so as to provide an unobstructed flow passage for said polymer, to begin a mold injection;

(b) inserting a tip portion of the needle means into closing relationship with said outlet orifice of said elongate passage means, to terminate flow of polymer therethrough to terminate a mold injection.

4,595,553

METHOD FOR VENTLESS TIRE MOLDING

Jerome J. Blayne, Brecksville; James Sidles, Richfield, and Donald R. Bartley, Cuyahoga Falls, all of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 674,397, Nov. 23, 1984. This application Sep. 30, 1985, Ser. No. 781,578

Int. Cl.[4] B29H *5/02*

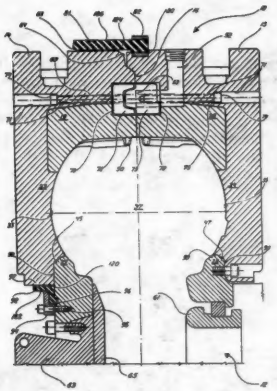
U.S. Cl. 264—501 **7 Claims**

1. In a process wherein a green tire having tread, sidewall and bead portions is formed and then molded within a tire mold having tread, sidewall and bead components defining a mold cavity, such components being essentially free of apertures leading from the mold cavity to a point external to the mold, and a parting circumferential line dividing the mold into sections, the mold closing to the parting line to effectuate tire molding, the improvement comprising:

placing the green tire within the mold cavity;

partially closing the mold to be open along the parting line not more than about 5.08 and not less than about 0.10 centimeters;

annularly surrounding in a sealing relationship the parting line radially outwardly of the tread components employing a seal effectively sealing between outer surfaces of the mold as separated by the parting line and characterized by one seal surface being exposed to pressure within the mold cavity and an obverse seal surface being exposed to a pressure sourced outside the mold cavity, and whereby upon evacuation of the mold cavity, by inherent seal configuration, the seal is urged into a more tightly sealing relationship, the seal being configured to sealingly engage beginning in a range of mold openings along the parting line of between 0.10 and not more than 5.08 centimeters to substantially preclude the movement of air into the mold cavity, and the seal being configured to be capable of



continuing to preclude such air movement during and after mold closure

providing a source of vacuum interconnectably joined employing a conduit means to the parting line, and

drawing a vacuum on the mold.

4,595,554

PROCESS FOR THERMOFORMING THERMOPLASTIC SHEET MATERIALS

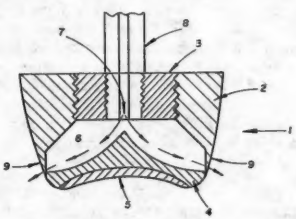
Lance W. Bullock, Wonga Park; Josip Vlahek, and Ferenc Kovacs, both of Tullamarine, all of Australia, assignors to W. R. Grace Australia Limited, Fawkner, Australia

Division of Ser. No. 455,618, Jan. 4, 1983, Pat. No. 4,500,277. This application Nov. 7, 1984, Ser. No. 669,193

Claims priority, application Australia, Mar. 2, 1982, PF2922

Int. Cl.[4] B29C *51/10*

U.S. Cl. 264—522 **4 Claims**



1. A method for thermoforming a thermoplastic sheet comprising the steps of:

(a) positioning a sheet of thermoplastic material over the opening of a forming cavity;

(b) softening said sheet by heating to a temperature above a softening point of said sheet;

(c) mechanically forming said softened sheet by stretching through contact with a plug wherein said plug comprises a body portion having a first thermal conductivity and at least one insert having a second thermal conductivity different from said first thermal conductivity; and

(d) circulating pressurized air through a central hollow inlet

of the body portion, and direction said air by said insert toward and through a porous side wall of the plug and against said sheet to assist in shaping said sheet in said forming cavity;

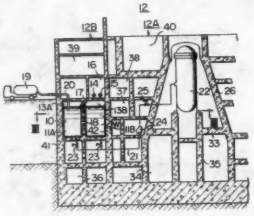
whereby steps (c) and (d) are used to vary the degree of stretching of said sheet at different portions of said sheet.

4,595,555

POWER PLANTS

Shoichi Orii, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 293,506, Aug. 17, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 580,285
Claims priority, application Japan, Aug. 26, 1980, 55-117376
Int. Cl.[4] G21C *9/00, 15/18*
U.S. Cl. 376—283 **4 Claims**



1. In a nuclear power plant of a boiling water reactor type including a reactor building containing therein a reactor core and including a reactor containment, a building annex to the reactor building, and a condensate storage area for storing excess condensate as an emergency source for suppressing a superheat condition in said reactor core upon a loss of coolant accident, the improvement wherein said reactor building and said annex building are constructed as a unitary reactor combination building having a lower portion thereof positioned underground, said condensate storage area being located within said reactor combination building in an underground portion of said annexed building and being divided into a plurality of separate, but fluid interconnecting condensate storage tanks containing respective condensates therein, said storage tanks being arranged side by side and communicating with each other by a condensate flow passage disposed above the bottom of said tanks and below a condensate level thereof, a plurality of air chambers being formed respectively in said plurality of condensate storage tanks and above the condensates contained therein, said air chambers in adjacent side by side storage tanks directly communicating with each other, and each of said condensate storage tanks being provided with a water supply pipe having one end immersed into the condensate therein and the other end extending outwardly through an outer wall of said reactor combination building.

4,595,556

METHOD FOR MANUFACTURING CAMSHAFT

Genkichi Umeha, Tokyo; Shigeru Urano, Saitama; Osamu Hirakawa, Saitama, and Shunsuke Takeguchi, Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

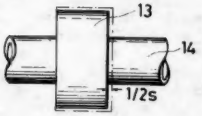
Filed Jan. 2, 1985, Ser. No. 688,136
Claims priority, application Japan, Jan. 12, 1984, 59-2628
Int. Cl.[4] B22F *7/00*
U.S. Cl. 419—8 **4 Claims**

1. A method for manufacturing a camshaft comprising the steps of:

forming a green compact of fitting members from a material which shrinks and yields a liquid phase when sintered;

preliminarily sintering said green compact to form a pre-sintered compact which has been shrunk axially by about 50% of a predetermined allowance of shrinkage at a temperature yielding a liquid phase;

fitting said pre-sintered compact on a steel shaft to produce a pre-sintered camshaft assembly; and



sintering said pre-sintered camshaft assembly whereby said pre-sintered compact yields a liquid phase and is fully sintered to a sintered compact which is axially shrunk by the remaining allowance of shrinkage and metallurgically bonded to said steel shaft.

4,595,557

METHOD OF INCREASING HERMETICITY OF METAL COMPONENTS OF GLASS/METAL AND CERAMIC/METAL SEALS

Benjamin Bowsky, Maineville, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 11, 1985, Ser. No. 722,014
Int. Cl.[4] B22F *3/00*
U.S. Cl. 419—49 **6 Claims**

1. The method of forming a hermetic seal with high hermeticity by subjecting components and/or raw stock and/or ingot to hot isostatic pressing, forming a body and/or pin from said stock, assembling said seal from said components and bonding said hermetic seal into an opening in a body.

4,595,558

ADDITIVE AGENTS FOR USE IN THE MANUFACTURE OF MOLDED PARTICULATE METAL ARTICLES

Roger A. Baldwin, Warr Acres; Jim W. Kauffman, and William C. Laughlin, both of Edmond, all of Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed May 17, 1985, Ser. No. 735,100
Int. Cl.[4] B22F *3/14*
U.S. Cl. 419—66 **7 Claims**

1. In a process for manufacturing a compacted article of blends of additive metals for use in preparing an alloyed base metal said process including providing a blended mixture of at least two different finely divided additive metals, one of said additive metals being the same as the base metal, introducing said blended mixture into a mold and subjecting said blended mixture in said mold to a pressure sufficient to compress said blended mixture into said compacted article, the improvements which comprise:

providing at least one processing aid selected from a group consisting of liquid polyglycol materials and derivatives thereof, corresponding to the general formula:

$$RO(R^2O)_nR^1$$

wherein each of R and R^1 individually is hydrogen or a monovalent hydrocarbon radical selected from straight and branched-chain lower alkyl radicals and the radical R^3CO— where R^3 is a straight or branched-chain lower alkyl radical and where R and R^1 may or may not be the same; wherein R^2 is a divalent alkylene radical containing from two to four carbon atoms; wherein n is a number ranging from 2 to about 20 and

admixing a stabilizing and lubricating amount of said processing aid with the blended mixture of additive metals prior to introducing the blended mixture of additive metals into said mold.

4,595,559

PROCESS FOR THE PRODUCTION OF COMPOSITE ALLOYS BASED ON ALUMINUM AND BORON AND PRODUCT THEREOF

Claude Planchamp, Chantilly, France, assignor to Fonderies Montupet, Nanterre, France

PCT No. PCT/FR83/00199, § 371 Date Jun. 4, 1984, § 102(e) Date Jun. 4, 1984, PCT Pub. No. WO84/01390, PCT Pub. Date Apr. 12, 1984

PCT Filed Oct. 4, 1983, Ser. No. 619,596

Claims priority, application France, Oct. 5, 1982, 82 17108

Int. Cl.[4] C22C *1/10, 21/00*

U.S. Cl. 420—528 6 Claims

1. A process for the production of a metallic matrix composite alloy having a high level of resistance to abrasion and the property of trapping neutrons, comprising the steps of:

(a) preparing aluminium boride in the form of particles with a mean grain size of between 5 and 30 μm encased with aluminium;

(b) introducing said encased aluminium boride into a previously refined aluminium or aluminium alloy bath protected at its surface by a deoxidizing flux, the quantity of boron in said bath being at most 30% by weight;

(c) agitating said bath throughout the period of introduction of said encased aluminium boride;

(d) controlling the introduction speed of said encased aluminium boride so as to maintain the bath above its solidification temperature;

(e) subjecting the bath to degassing in a nitrogen atmosphere or under vacuum subsequent to the introduction of said encased aluminium boride; and

(f) rapidly casting said degassed bath.

4,595,560

METHOD FOR STERILIZING PACKAGING MATERIAL AND/OR PACKAGING APPARATUS

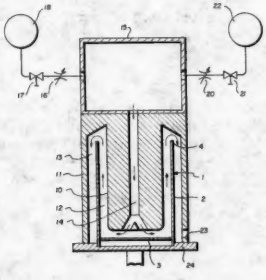
Norbert Buchner, Winnenden; Günter Vögele, Schönaich, and Bernd Wilke, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,834

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325786

Int. Cl.[4] A61L *2/08*

U.S. Cl. 422—26 6 Claims



1. A method for sterilizing surfaces of packaging material, packaging apparatus and associated equipment used in the packaging of an acidic product in order to render them free of germs capable of growing in such acidic products, comprising mixing hot air having a temperature from 80° C. to 120° C. and steam together at atmospheric pressure so as to provide a flowing moist mixture of water vapor and hot air and treating said surfaces with said flowing moist mixture of water vapor and hot air in which the mixture has a temperature of from 80° to 140° C. and a moisture content from 5 to 50%.

5. A method of sterilizing a container for an acidic product having a PH value of below 4.6 in order to render said container free of germs capable of growing in an acidic product, comprising: the steps of preheating said container by blowing hot air at a temperature of 80 degrees to 100 degrees C. into said container for a predetermined time interval, after said time interval mixing the hot air at a temperature of from 80 degrees to 120 degrees with saturated steam at atmospheric pressure to create a flowing mixture of hot air and water vapor having a temperature of 85 degrees to 140 degrees and a saturated steam content of 10 to 50% and directing said hot air and water vapor into and around said container for a predetermined time interval in a sterilization phase, and removing any moisture from the container by directing sterile hot air at a temperature of from 80 degrees to 120 degrees C. in and around said container.

4,595,561

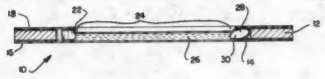
LIQUID SAMPLE HOLDER

Michael G. Thornton, and Benton C. Clark, III, both of Littleton, Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Nov. 19, 1984, Ser. No. 672,464

Int. Cl.[4] G01N *21/03;* G02B *21/34*

U.S. Cl. 422—58 4 Claims



1. A holder for a liquid sample to be analyzed, said holder comprising:

a first sheet having a surface on which a liquid sample is placed,

a spacer having opposite major surfaces and having one major surface abutting said surface of said first sheet, said spacer having surface portions extending transverse to said surface of said first sheet and defining a hole and for confining the liquid sample to an area of said surface of said first sheet defined by said surface portions,

a second sheet abutting the other of said major surfaces of said spacer, said second sheet having a projection which projects into said hole and which defines along with said first sheet and said spacer a space volume for the liquid sample to be analyzed and an overflow volume communicating with said space volume and encircling said space volume,

said overflow volume having a dimension measured in a direction perpendicular to said surface of said first sheet greater than the dimension of said space volume measured in the same direction for trapping air bubbles and for receiving liquid in excess of that needed to fill said space volume.

4,595,562

LOADING AND TRANSFER ASSEMBLY FOR CHEMICAL ANALYZER

Max D. Liston, Irvine, and Paul K. Hsei, Huntington Beach, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 284,840, Jul. 20, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,437

Int. Cl.[4] G01N *35/04, 35/06*

U.S. Cl. 422—65 1 Claim

1. A transfer assembly in combination with a chemical analyzer for presenting a plurality of individual sample containers, having fluid samples therein, to the chemical analyzer which performs selected tests on the fluid samples, said assembly comprising:

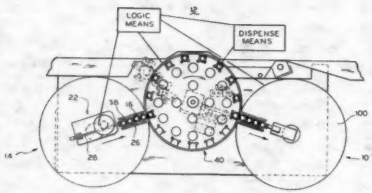
first support means for supporting a plurality of individual sample containers for movement in a desired direction past a plurality of positions at which one or more operations are conducted on containers or the samples therein and signaling means associated with said support means

for indicating whether said support means is in a moving or stationary mode of operation;

first means arranged adjacent said supporting means at a first position for automatically inserting individual sample containers into said supporting means and means associated with said support means for preventing the nongentle insertion of the individual sample containers into said support means, the first means comprising a second support means for receiving a plurality of individual sample containers in a random order and a container displacing means associated with said second support means to laterally displace containers from said second support means into said first support means responsive to the operation of the chemical analyzer;

second means arranged adjacent said first support means at a second position forward of said first position for identifying individual sample containers supported therein having means for sensing an information code on individual sample containers, said container displacing means randomly introducing individual sample containers into said support means at a position rearwards of said identifying means and forward or rearward of said automatic insertion means;

third means arranged at a third position forward of said second position for dispensing at least a portion of the fluid sample from each individual sample container, and further including means for positioning said dispensing means at a predetermined height, means for detecting the fluid sample level in the containers, and means for adjusting the height of individual sample container in response to said detection means so as to bring said fluid sample levels to a desired height in relation to said predetermined height;



fourth means associated with said support means for sequentially removing individual sample containers therefrom at a fourth position forward of said third position;

storage means for receiving individual sample containers removed from said support means at said fourth position, said storage means including means for identifying location of the individual fluid sample containers received therein; and

means for controlling said transfer assembly to intermittently move individual sample containers past each of said first, second and third means and for controlling the operation of each of said first, second and third means whereby sample containers can be randomly inserted into said support means and wherein said control means further comprises a means for operating and selecting the test to be performed by said chemical analzyer in response to individual sample container identification obtained by said identifying means.

4,595,563

APPARATUS FOR SAMPLE TRANSFER AND ANALYSIS BY CENTRIFUGATION

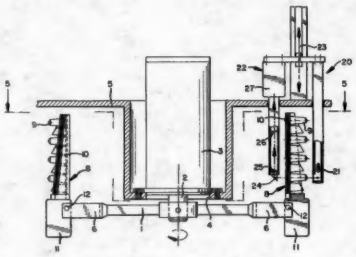
Philippe L. Degrave, Viroflay, France, assignor to Kontron Holding A.G., Zurich, Switzerland

Filed May 10, 1985, Ser. No. 733,285

Claims priority, application Switzerland, May 11, 1984, 2339/84; Aug. 14, 1984, 3894/84

Int. Cl.[4] G01N *21/01, 35/02, 21/84*

U.S. Cl. 422—72 **9 Claims**



1. An apparatus for sample transfer and analysis by centrifugation, comprising a drive system including a motor, a rotor connected to the drive system, said rotor having at least one arm extending radially from the connection of the rotor to the drive system, a cuvette carrier including a base portion and a cuvette carrying portion connected to said base portion, said cuvette carrying portion being adapted to receive a cuvette assembly, said base portion being pivotally connected to said arm at the end of said arm distal to said connection, said arms and said cuvette carrier being disposed along a substantially horizontal axis, the mass of the portion of the cuvette carrier situated between the pivotal and its distal end being less than the mass of the portion of the cuvette carrier situated between the pivotal connection and its end proximate the rotor whereby upon a first centrifugal speed, the cuvette carrier is tilted upwardly from the horizontal axis to one angle of inclination with respect to the horizontal axis at which inclination sample transfer can occur and upon increasing the rotational speed to a second rotational speed, to a second angle of inclination higher than the first with respect to said horizontal axis and at which sample analysis can occur and means for analyzing the sample at said second angle.

4,595,564

CARTRIDGE-TYPE AROMA PERCOLATOR

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087, and Robert H. Miller, 11 Woodbine Trail, Parsippany, N.J. 07054

Continuation-in-part of Ser. No. 357,630, Mar. 12, 1982. This application Jul. 2, 1984, Ser. No. 626,726

Int. Cl.[4] A62B *7/08*

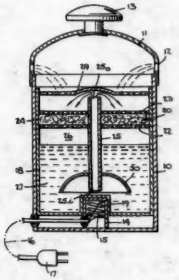
U.S. Cl. 422—125 **5 Claims**

1. A cartridge-type aroma percolator comprising:

(A) a container having an inside bottom surface, an electrical heater secured to the inside bottom surface and a removable vented cap; and

(B) a replaceable cartridge telescopically received in said container, said cartridge being constituted by a can having a toroidal insert permeable to liquid secured at a position adjacent the top of the can and arranged so that it extends across an entire cross section of the can, the can and insert definining a chamber in the can below the toroidal insert that is partially filled with a pool of an aqueous solution of liquid fragrance, said insert having a hollow core and incorporating a porous pad surrounding the core, and a tube coaxial with the can extending through the hollow core of the insert, the lower end of the tube forming a liquid inlet immersed in the pool, whereby when the

heater in the container is energized, the liquid in the can in a region above the heater is boiled to produce a gas pressure in a head space located above the pool in the chamber, forcing the liquid up the tube discharging it from the outlet thereof and showering it down on the insert thus percolating it through the pad before returning it to the pool, an aromatic vapor being exuded from the pad and



discharged into the atmosphere through the vented cap, and whereby when the liquid is exhausted, one may dispose of the spent cartridge and replace it with a fresh cartridge; and

(C) removable cover means for hermetically sealing said can, and for storing the contents thereof, while the cartridge is not in use.

4,595,565

EQUIPMENT FOR MIXING LIQUID REACTANTS

Rudolf J. Tenhagen, Longirod, Switzerland, assignor to BP Chemicals Limited, London, England

Filed Aug. 29, 1984, Ser. No. 645,482

Claims priority, application United Kingdom, Aug. 31, 1983, 8323321

Int. Cl.[4] B01F *5/04*

U.S. Cl. 422—133 **9 Claims**

1. A mixing head for mixing two or more liquids, said mixing head comprising:

a cylinder having two portions of different cross-sectional areas interconnected for liquid flow therebetween and having a delivery end, one of said portions having a smaller cross-sectional area than the other of said portions and defining a mixing zone and the other of said portions having a larger cross-sectional area and defining a discharge zone;

nozzles, one for each of the liquids, connected to said one of said portions of said cylinder for supplying said liquids to said mixing zone; and

a reciprocable piston mounted in said cylinder for reciprocation toward and away from said delivery end of said cylinder, said piston having a cross-section substantially equivalent to that of the combined mixing and discharge zones operable in both zones for the discharge of the mixed liquids whereby movement of said piston toward said delivery end causes removal of mixed said liquids from both portions of said cylinder.

4,595,566

CONTINUOUS REACTOR DESIGN

Audis C. Byrd, Duncan; Robert J. Morris, Lawton; Robert H. Black, and Jimmie D. Weaver, Jr., both of Duncan, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 30, 1984, Ser. No. 615,440

Int. Cl.[4] B01F *15/02*

U.S. Cl. 422—134 **10 Claims**

1. In combination, a polymer mixing system having a source of supply of unreacted polymeric fluids, said polymer mixing system having the outlet thereof connected to a flow line supplying fluid for injection into a well and a continuous reactor for reacting said unreacted polymeric fluids therein to form a reacted polymeric fluid injection into said flow line supplying fluid for injection into said well, said continuous reactor for use in said polymer mixing system, wherein:

said polymer mixing system comprises:

a plurality of fluid tanks to serve as said source of supply of said unreacted polymeric fluids, each tank having an inlet and an outlet; and

a plurality of pumps, each pump having the inlet thereto connected to the outlet of one of said plurality of tanks and an outlet therefrom, said plurality of pumps for pumping said unreacted polymeric fluids from said plurality of tanks to said continuous reactor; and

said continuous reactor connected to the outlets of the plurality of pumps, said continuous reactor for reacting said unreacted polymeric fluids therein to form a reacted polymeric fluid when said unreacted polymeric fluids are pumped by said plurality of pumps thereinto, said continuous reactor comprises:

a housing; and

a translatable piston contained within the housing slidably, sealingly engaging the interior thereof, the translatable piston dividing the housing into two mixing chambers in which said unreacted polymeric fluids are reacted to form said reacted polymeric fluid for injection into said well, the translatable piston being moved in the housing solely in response to the pumping of said unreacted polymeric fluids into said continuous reactor whereby when said unreacted polymeric fluids are pumped into one mixing chamber of the housing of said continuous reactor said unreacted polymeric fluids move the translatable piston within the housing thereby simultaneously forcing said reacted polymeric fluid from the other chamber of the housing of said continuous reactor into said flow line supplying fluid for injection into said well.

4,595,567

COOLING FLUIDIZED CATALYTIC CRACKING REGENERATION ZONES WITH HEAT PIPE APPARATUS

Brian W. Hedrick, Rolling Meadows, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 28, 1984, Ser. No. 687,359

Int. Cl.[4] F23C *11/02*

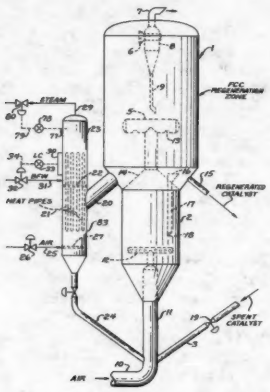
U.S. Cl. 422—146 **25 Claims**

1. An apparatus for the combustion of carbonaceous materials present on fluidizable particles employed in a hydrocarbon conversion process which comprises:

(a) means for confining a fluidized mass of said particles comprising a chamber, a particle inlet, a particle outlet, an oxygen-containing gas inlet and a flue gas outlet, with the flue gas outlet communicating with an upper end of the chamber;

(b) a steam generating chamber having associated therewith a means to charge liquid water to the steam generation chamber and remove steam from an upper end of the

steam generation chamber at a point above a level at which water would rest in a lower portion of the chamber; and,



(c) a plurality of heat pipes, each heat pipe having a lower first end located within said means for confining the fluidized mass of particles and an upper second end located within said steam generation chamber.

4,595,568

PHOTOSENSITIVE CELL FOR THE DECOMPOSITION OF WATER

Henri Van Damme, Olivet; José J. Fripiat, La Ferte St. Aubin; Hubert Nijs, Orleans; Philippe Marceau, Orleans la Source, and Obrecht Francois, La Chappelle St-Mesmin, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Filed Jun. 20, 1983, Ser. No. 505,909

Claims priority, application France, Jun. 28, 1982, 82 11280

Int. Cl.[4] C01B *3/06;* **C25B** *1/04;* **B01J** *19/08*

U.S. Cl. 422—186 **11 Claims**

1. A photosensitive cell for the decomposition of water, comprising an aqueous medium containing a photosensitizer positively charged both in the reduced state and in the oxidised state, an acceptor, an oxygen-forming catalyst, a first support to which said oxygen-forming catalyst fixed and formed by a first, negative-charge-carrying colloid of large-surface tectosilicates and phyllosilicates, which as a result of isomorphic substitutions in the crystal lattice carry a permanent negative charge, a hydrogen-forming catalyst, and a second support to which said hydrogen-forming catalyst is fixed and formed by a second, positive-charge-carrying colloid of colloidal silica modified by a pH adjustment, below the zero charge point, hydrotalcites, or a mixed colloidal hydroxide of Al^{3+} and Eu^{3+} or In^{3+}.

4,595,569

DEVICE FOR DESULPHURIZING AND DENITRATING FLUE GASES BY ELECTRON IRRADIATION

Gottfried Reuter, Lemförde, and Peter Holl, Tübingen, both of Fed. Rep. of Germany, assignors to Polymer-Physik GmbH & Co. KG, Fed. Rep. of Germany

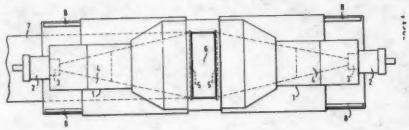
Filed Jan. 14, 1985, Ser. No. 691,114

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403726

Int. Cl.[4] B01J *19/08*

U.S. Cl. 422—186 **6 Claims**

1. Device for the desulfurization and denitration of flue gases by electron beam irradiation of the flue gases to which ammonia has been added prior to the irradiation, consisting essentially of a reaction canal and two sources of electron beams, wherein low energy sources of electron beams are used with an acceleration voltage for the electrons of 250 keV, of which each has only one has an electron exit window, the support lattice of which is formed from several double comb-like



bridge elements disconnectably connected with the window-frame, each of which has a main bridge which is provided with a bore as cooling pipe, the electrons emerging from the source of electron beams through the electron window passing directly into the reaction canal.

4,595,570

APPARATUS AND METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

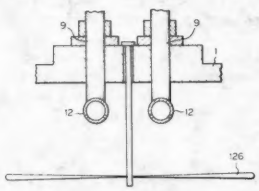
Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 583,181, Feb. 24, 1985, abandoned. This application Sep. 5, 1985, Ser. No. 772,208

Claims priority, application Japan, Feb. 25, 1983, 58-29371; Feb. 25, 1983, 58-29372; Mar. 10, 1983, 58-38204

Int. Cl.[4] B01J *19/08*

U.S. Cl. 422—186.05 **2 Claims**



1. An apparatus for plasma treatment, capable of plasma-treating works of resin material by irradiating the surfaces of the works with a microwave discharge plasma within a vacuum reaction chamber, comprising a plasma introducing port formed in the wall of the reaction chamber, a plasma-irradiating pipe connected to the plasma introducing port, said plasma-irradiating pipe being provided with a number of nozzle holes for injecting the plasma into the reaction chamber to form a flow of plasma and to irradiate therewith the surfaces of the works, a discharge port formed in the wall of the reaction chamber to reduce the internal pressure of the reaction chamber, and a plasma diffuser including a rotatable vane for diffusing said flow of plasma to distribute uniform density of plasma in the reaction chamber, wherein said vane is disposed proximate to said plasma-irradiating pipe for reducing pressure and to rotate said vane by the flow of plasma.

4,595,571

LIQUID-LIQUID EXTRACTOR AND METHOD FOR USING SAME

George M. Galik, 3236 Falcon Ridge Rd., Diamond Bar, Calif. 91765

Filed Sep. 5, 1984, Ser. No. 647,994

Int. Cl.[4] B01D *11/04*

U.S. Cl. 422—259 **33 Claims**

1. Apparatus for contacting a first liquid medium with a

second substantially immiscible heavier liquid medium, the apparatus comprising:

(a) an elongated, generally vertical extraction column open at its top and bottom;

(b) means in fluid communication with the open bottom of the extraction column for mixing the first and second liquid mediums together to thereby form a dispersion of droplets of one of the liquid mediums in the other liquid medium and for pumping the dispersion through the extraction column and out its open top;

(c) a settling tank assembly for separating the dispersion, the settling tank assembly including a settling tank wherein the extraction column extends vertically through the bottom of the settling tank with the open top of the extraction column housed within the settling tank, the settling tank assembly also including:

(i) a baffle assembly comprising a plurality of vertically spaced apart baffles housed within the settling tank wherein an upper section of the baffle assembly defines a sinuous generally upwardly directed flow path for the first liquid medium as it separates from the dispersion and rises to the top of the settling tank and a lower section of the baffle assembly defines a sinuous generally downwardly directed flow path for the second relatively heavier liquid medium as it separates from the dispersion and sinks toward the bottom of the settling tank; and

(ii) an outlet near the top of the settling tank for removal of the separated first liquid medium and an outlet near the bottom of the settling tank for removal of the separated second liquid medium.

4,595,572

RECOVERING GOLD AND SILVER FROM AN AQUEOUS SOLUTION CONTAINING CYANIC COMPOUNDS OF GOLD AND SILVER

Tadayoshi Ogasa, Ichikawa, and Fumio Kondo, Kashiwa, both of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 547,345, Oct. 31, 1983, abandoned. This application Nov. 28, 1984, Ser. No. 675,463

Claims priority, application Japan, Sep. 10, 1983, 58-167323

Int. Cl.[4] C22B *11/08*

U.S. Cl. 423—25 **7 Claims**

1. A method of preferentially recovering gold and silver from an aqueous solution containing cyanic compounds of gold, silver, and metals selected from the group consisting of copper, nickel, cobalt, zinc and iron, said solution containing between about 0.5 to 30 mg/l of gold, about 0.5 to 30 mg/l of silver, about 5 to 20 mg/l of the metals selected from the group consisting of copper, nickel, cobalt, zinc and iron, and 5 to 50 mg/l of free cyan selected from the group consisting of sodium cyanide and potassium cyanide, said method comprising the steps of (a) adding a mineral acid to said aqueous solution to reduce its pH to 6.0 or less, and (b) passing said acidified aqueous solution through a bed of active carbon.

4,595,573

CHLORINATOR FURNACE AND METHOD FOR PRODUCING TETRACHLORIDE OF SUCH METALS AS TITANIUM AND ZIRCONIUM

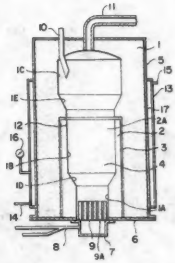
Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Continuation of Ser. No. 365,525, Apr. 5, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 701,667

Claims priority, application Japan, Apr. 20, 1981, 56-58451

Int. Cl.[4] C01G *23/02, 25/04*

U.S. Cl. 423—76 **2 Claims**



1. A method for producing tetrachloride of a metal selected from the group consisting of titanium and zirconium, comprising: providing a reaction chamber which is defined by a wall structure of refractory material and arranged in an airtight encasement of metal, said reaction chamber comprising a reaction zone ranging downwards from an intermediate level thereof, said encasement including a jacket formed of a double wall construction around the reaction zone, communicating means comprising holes between the inside of said jacket and said reaction chamber, heating said reaction chamber, filling said jacket with a gas, introducing a solid reaction mixture comprising a compound of the metal to be chlorinated, supplying a gas mixture comprising chlorine to said reaction zone through a tube connected to the chamber bottom to cause reaction at a positive pressure over the atmosphere to produce the tetrachloride of the metal, maintaining a positive pressure relative to the atmosphere in both said jacket and said reaction chamber and a pressure is in the jacket higher than that within said reaction chamber so as to provide a continuous stream of gas to flow into said reaction zone via said communicating means to sweep vapor of chlorine and chlorides away from the inside face of the encasement and thereby protect it from attack.

4,595,574

METHOD FOR RECOVERING ZINC FROM SUBSTANCES CONTAINING A ZINC COMPOUND

Toshio Matsuoka; Shinichi Kurozu; Yukio Koyabu; Tadamitu Nagayasu, all of Niihama, and Seiji Sugimori, Saijo, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,030

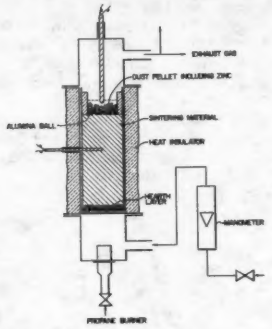
Claims priority, application Japan, Jan. 26, 1984, 59-11068; Jan. 26, 1984, 59-11069

Int. Cl.[4] C01G *9/03*

U.S. Cl. 423—107 **1 Claim**

1. A method for recovering zinc from substances containing a zinc compound which comprises supplying a carbonaceous substance and a zinc compound-containing substance, after agglomeration and coating with a calcium compound, onto the hearth layer in a sintering apparatus, metallizing and vaporiz-

ing zinc in said substance to separate the compound therefrom by forming a locally strong reducing atmosphere at the combustion temperature of the lowest layer of sintering material,



oxidizing the resultant zinc vapor into zinc oxide under a strong oxidizing atmosphere outside agglomerates, and then discharging the resultant zinc oxide as such from said sintering apparatus selectively.

4,595,575

PROCESS FOR THE CONTINUOUS PURIFICATION OF WASTE GASES WITH ACTIVATED CARBON

Franz D. Oeste, Münzenberg, and Joachim R. Kempfert, Kronberg, both of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Fed. Rep. of Germany

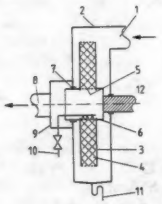
PCT No. PCT/EP84/00431, § 371 Date Mar. 19, 1985, § 102(e) Date Mar. 19, 1985, PCT Pub. No. WO85/02786, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 18, 1984, Ser. No. 717,228

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346176; Nov. 24, 1984, 3442925

Int. Cl.[4] B01D *39/00, 53/00;* **B01J** *8/00*

U.S. Cl. 423—210 **8 Claims**



1. A process for the continuous wet or wet-catalytic purification of waste gases by chemisorption adsorption of gaseous pollutants on activated carbon and desorption of these pollutants or their reaction products, characterized in that activated carbon is arranged in a rotor of a sieve-centrifugal filter and the waste gas passes through the activated carbon and issues via a perforated portion of a hollow shaft, while at the same time the desorbent flows through the activated carbon bed from the center outwardly.

4,595,576

PROCESS FOR FLUE GAS DESULFURIZATION

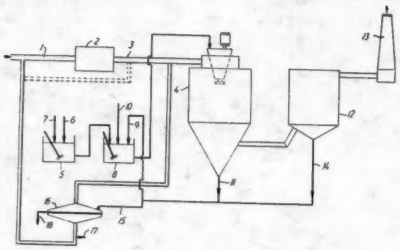
Jens Andreasen, Espergaerde; James R. Donnelly, Ballerup; Karsten S. Felsvang, Allerod; Ebbe S. Jons, Vaerlose, all of Denmark, and Preston L. Veltman, Severna Park, Md., assignors to A/S Niro Atomizer, Soborg, Denmark

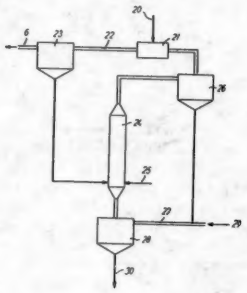
Filed Aug. 31, 1982, Ser. No. 413,419

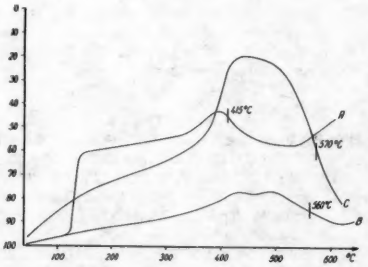
Claims priority, application Denmark, Sep. 4, 1981, 3912/81; Sep. 8, 1981, 3978/81

Int. Cl.[4] C01B *17/00;* **B01J** *8/00;* **C01D** *5/00;* **C01F** *11/46*

U.S. Cl. 423—242 **10 Claims**







1. A process for the desulfurization of a hot flue gas comprising:

(a) atomizing an aqueous suspension or solution comprising a basic absorbent for sulfur oxides into the hot flue gas for simultaneous absorption of sulfur oxides present in the flue gas and drying of the atomized droplets;

(b) recovering a dry material produced in step (a) containing sulfite and sulfate which material is recovered as a powder also containing any fly ash originally present in the flue gas, and

(c) heating at least a portion of the recovered powder at a

temperature of 350°–600° C. in the presence of an oxygen containing gas containing 5–100% by volume oxygen so as to convert a substantial part of said sulfite into sulfate.

4,595,577

TREATMENT OF GASES CONTAINING ORGANIC SULPHUR COMPOUNDS

Georges Stas, Ottignies, Belgium, and Christian Biver, L-Hagen, Luxembourg, assignors to Interox (Société Anonyme), Brussels, Belgium

Division of Ser. No. 363,950, Mar. 31, 1982, Pat. No. 4,443,342. This application Mar. 26, 1984, Ser. No. 593,576

Claims priority, application France, Mar. 31, 1981, 81 06589

Int. Cl.⁴ B01J *8/00*

U.S. Cl. 423—245 **8 Claims**

1. Process for the treatment of waste gases containing dialkyl disulphides, by catalytic oxidation of these compounds by means of a peroxide compound, in an aqueous medium, wherein divalent copper ions are used as the catalyst, the medium is kept at a pH of 2.5 to below 6.5, from 0.001 to 1 gram of copper ions is used per liter of medium, and the peroxide compound is used in an amount such that the ratio of the amount of peroxide compound, expressed in mol equivalents of 100% strength H_2O_2, to the amount dialkyl disulphides, expressed in mol equivalents of H_2S, is 0.5 to 10, the waste gases being washed by means of the medium.

4,595,578

STABILIZED SILICA GEL AND PROCESS FOR MAKING SAME

Howard J. Cohen, Baltimore; Peter van der Heem, Perryville, and Steven J. Fitch, Baltimore, all of Md., assignors to SCM Corporation, New York, N.Y.

Filed Mar. 22, 1985, Ser. No. 714,799

Int. Cl.⁴ C01B *33/16*

U.S. Cl. 423—338 **16 Claims**

1. A process for producing a silica gel having improved pore volume relative to conventional silica gels which process comprises the steps of gelling an aqueous alkali metal silicate with an aqueous acid, washing the resulting gel to remove salt or salts and acid, aging said gel for 3 to 36 hours with aqueous ammonia solution and soaking the gel in an aqueous solution of a water soluble aluminum salt to impart from 0.1 to 0.7% by weight aluminum on the dry basis to said gel, drying and reducing the particle size of the dried gel to from 2.0 to 15 microns, said particles having a pore volume in the range of 1.25 to 2.25 cm^3/gram.

4,595,579

PROCESS FOR INITIATING A REACTION FOR THE MANUFACTURE OF SYNTHETIC HYDROCHLORIC ACID

Francois Prudhon, Versailles, and Patrick Mangin, Grenoble, both of France, assignors to Vicarb S.A., Saint Martin d'Heres, France

Filed Feb. 12, 1985, Ser. No. 700,739

Claims priority, application France, Feb. 24, 1984, 84 03086

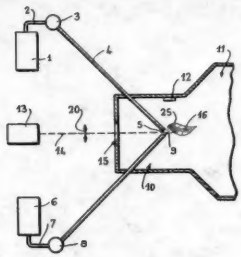
Int. Cl.⁴ C01B *7/01*

U.S. Cl. 423—487 **9 Claims**

1. A process for initiating a self-promoting reaction for the manufacture of synthetic hydrochloric acid, comprising:

(a) supplying molecules of reactive chlorine gas and hydrogen gas to a zone of mixture where said reactive gases are brought together to form a homogeneous mixture, said chlorine molecules having an absorption band frequency and an absorption band wavelength; and

(b) exciting said chlorine molecules by directing a laser pulse onto said zone of mixture, thereby initiating the self-promoting reaction for the manufacture of synthetic hydrochloric acid.



4,595,580

METHOD FOR MANUFACTURING FINE POWDER OF BARIUM ZIRCONATE

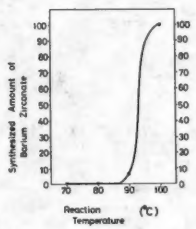
Satoru Uedaira; Masayuki Suzuki, both of Yokohama; Hiroshi Yamanoi, Hiratsuka, and Hidemasa Tamura, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,387

Claims priority, application Japan, Dec. 15, 1982, 57-219540

Int. Cl.⁴ C01F *11/00*

U.S. Cl. 423—593 **7 Claims**



1. A method of manufacturing fine powder of barium zirconate which comprises the steps of:

hydrolyzing an inorganic zirconium compound to produce a hydrolysate; and

reacting the hydrolysate thus produced with a water-soluble barium compound in an aqueous alkaline solution having a pH not lower than 13.6, and at a temperature not lower than 90° C., to produce said barium zirconate directly.

4,595,581

BOEHMITE PRODUCTION BY PRECIPITATION FROM SODIUM ALUMINATE SOLUTION AT ELEVATED TEMPERATURES

Chanakya Misra, and Thinnalur J. Sivakumar, both of Plum Borough, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 680,010, Dec. 10, 1984, abandoned. This application Jun. 5, 1985, Ser. No. 741,490

Int. Cl.⁴ C01F *7/04*

U.S. Cl. 423—625 **19 Claims**

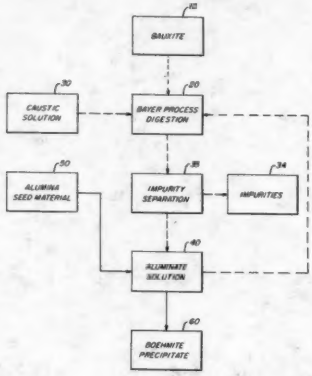
1. A process for producing substantially pure boehmite comprising the steps of

(a) heating to a temperature of about 115°–145° C. an aqueous aluminate solution containing about 100–400 g/l caus-

tic soda (expressed as Na_2CO_3) and about 0.50–0.80 grams Al_2O_3 per gram of caustic soda (expressed as Na_2CO_3),

(b) treating the heated solution with a seed material consisting essentially of alumina, thereby to form a precipitate comprising greater than about 95 wt % boehmite, and

(c) separating precipitated boehmite from the heated solution, thereby to form a used solution.



4,595,582

DYESTUFF COMPOSITION FOR HISTOLOGICAL EXAMINATIONS

Gyorgy Balogh, and György Csaba, both of Budapest, Hungary, assignors to Reanal Finomvegyszergyar, Budapest, Hungary

Continuation-in-part of PCT HU82/00061, Nov. 18, 1982, published as WO83/01779, May 26, 1983

Filed Jul. 20, 1983, Ser. No. 515,924

Claims priority, application Hungary, Nov. 20, 1981, 3471/81

Int. Cl.[3] **G01N** *1/30, 33/48;* **C09B** *67/00*

U.S. Cl. 424—3 **19 Claims**

1. A dyestuff composition for histological examination, which comprises

(1) a product formed by the interaction of one molar proportion of thionin dyestuff selected from thionin, toluidine blue and dimethyl thionin with a molar proportion of resorcinol from about 0.2 to 5 moles at a temperature of from about 70 degrees centigrade to about 120 degrees centigrade,

(2) $0.5(M_T/M_A)$ to $2(M_T/M_A)$ moles of a dyestuff "A", and

(3) $0.5(M_T/M_B)$ to $2(M_T/M_B)$ moles of a dyestuff "B", wherein

dyestuff "A" and dyestuff "B" are alkaline dyestuffs different in color and pH, both dyestuff "A" and dyestuff "B" can be mixtures of alkaline dyestuffs similar in color and pH,

M_T is the molecular weight of the thionin dyestuff,

M_A is the molecular weight of dyestuff "A", and

M_B is the molecular weight of dyestuff "B", or

when any of the thionin dyestuff, dyestuff "A" and dyestuff "B" is a mixture of more substances, M_T, M_A and M_B represent the weighed average of the molecular weights of the components of the thionin dyestuff, dyestuff "A" and dyestuff "B", respectively.

4,595,583

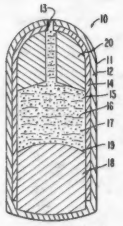
DELIVERY SYSTEM CONTROLLED ADMINISTRATION OF BENEFICIAL AGENT TO RUMINANTS

James B. Eckenhoff, Los Altos; Richard Cortese, San Jose, and Felix A. Landrau, Milpitas, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Mar. 19, 1984, Ser. No. 590,778

Int. Cl.[4] **A61K** *9/22;* **A61M** *31/00*

U.S. Cl. 424—15 **88 Claims**



1. A delivery system for delivering a beneficial agent formulation to an environment of use, the delivery system comprising:

(a) a wall that surrounds and defines an internal lumen, the wall comprising a semipermeable composition that is permeable to the passage of fluid and substantially impermeable to the passage of a beneficial agent;

(b) means in the lumen for maintaining the delivery system in the environment of use over time, said means having a density of at least 1.5;

(c) means in the lumen for expanding and occupying an increased volume of the lumen;

(d) a heat sensitive beneficial agent formulation in the lumen that forms a dispensable formulation at a temperature of at least 31° C.; and,

(e) means in the delivery system for communicating with the lumen for delivering the beneficial agent to the environment of use over time.

4,595,584

RUMEN-STABLE PELLETS

Stephen H. W. Wu, and M. Akram Sandhu, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 498,446, May 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 397,314, Jul. 12, 1982, abandoned. This application Jan. 7, 1985, Ser. No. 689,405

Int. Cl.[4] **A61K** *9/22, 9/32, 9/36*

U.S. Cl. 424—19 **9 Claims**

1. In a composition adapted for use in coating pellets orally administrable to a ruminant which protects the core material in the rumen and releases it in the abomasum comprising

(a) from about 16 to about 87% based on the total composition weight of a film-forming polymeric material comprising a polymer, copolymer or mixture thereof having a molecular weight of from 5,000 to 300,000, said polymeric material having basic amino groups the nitrogen content of which constitutes between about 2 and about 14% by weight, of the polymeric material.

(b) from about 0.5 to about 32%, based on the total composition weight of a hydrophobic material dispersed in said polymeric material selected from the group consisting of waxes, resins, polymers, fatty acids having from 12 to 32 carbon atoms, aluminum salts of fatty acids having from 12 to 32 carbon atoms and polyfunctional carboxylic acids having a ratio of from 10 to 22 carbon atoms per carboxyl group having a molecular weight of from 400 to 1,000, and

(c) from about 7 to about 80%, based on the total composition weight, of a flake material dispersed in said polymeric

material the improvement comprising, said flake material having a relatively high degree of hydrophobicity due to the flake material having been treated by bringing the flake material into rubbing contact by milling with said hydrophobic material so that the surfaces of the particles of flake material become hydrophobic.

said polymeric material in combination with said hydrophobic material and flake material being physiologically acceptable and resistant to a pH of greater than about 5 but capable of releasing the core of the pellets at a pHD of less than about 3.5, said coating having a sticking temperature of at least about 50° C.

4,595,585
COSMETIC COMPOSITION CONTAINING A POLYCONDENSATE

Christos Papantoniou, Montmorency; Jean Mondet, Drancy, and Claudine Lapoiriere ex. spouse Vandenbossche, Aulnay-sous-Bois, all of France, assignors to L'Oreal, Paris, France

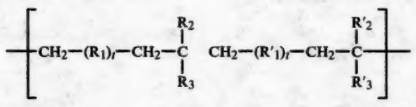
Filed Apr. 17, 1984, Ser. No. 601,355

Claims priority, application France, Apr. 18, 1983, 83 06293; Apr. 19, 1983, 83 06365

Int. Cl.⁴ A61K *7/00, 9/00, 7/06*

U.S. Cl. 424—47 **5 Claims**

1. A process for setting the hair comprises applying thereto a hair setting amount of a composition which contains in an aqueous or alcohol solution wherein the alcohol is selected from the group consisting of ethanol and isopropanol from 0.5 to 25 percent by weight of a polycondensate having units of the formula



(I)

wherein

t is 0 or 1, and

when t = 1, R_1 and R'_1 each idependently represent linear or branched alkylene having 1–38 carbon atoms; linear or branched alkylene having 1–38 carbon atoms and interrupted by —CONH— or —CO—; alkenyl or alkynyl having 2–18 carbon atoms; cycloalkylene having 5–6 carbon atoms; 1,4-dimethylene cyclohexane; phenylene; xylylene; diphenylene; diphenylene methane; 2,2-diphenylene propane; or a divalent radical of the formula

—CHR′—O—$C_2H_3(R')O]_n$HCR′—

wherein n is 0–20 and R′ represents hydrogen or methyl, and

R_2, R'_2, R_3 and R'_3 each independently represent —$COOR_4$, —CN, —$CONH_2$ or —$COCH_3$, wherein R_4 represents hydrogen, linear or branched alkyl having 1–18 carbon atoms or cycloalkyl having 5–6 carbon atoms.

4,595,586
MOISTURIZING LOTION

Merlyn G. Flom, Noblesville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 30, 1985, Ser. No. 771,450

Int. Cl.⁴ A61K *7/42, 7/44*

U.S. Cl. 424—59 **3 Claims**

1. A moisturizing lotion which facilitates make-up application and increases cell-turnover rate consists essentially of the following ingredients, in percent by weight:

Ingredient	Weight Percent
carbomer 941	0.1
glycerin	4.5
xanthan gum	0.1
allantoin	0.2
panthenol	1.0
triethanolamine	0.3
stearic acid	0.5
PEG-100 stearate	1.0
glyceryl stearate	1.0
cetyl alcohol	1.0
isostearic acid	2.5
squalane	2.8
cetearyl octanoate	1.5
mineral oil and lanolin alcohol (85:15, w:w)	2.0
jojoba oil	2.5
corn oil	0–0.4
dioctyl adipate, octyl stearate and octyl palmitate (25:41:34, w:w:w)	3.0
corn oil, BHA and BHT (3:1:1, w:w:w)	0.05
sunscreen(s)	1.4–3.0
preservatives	0.1–1.0
colorant(s)	0.001–0.005
fragrance	0.05–0.5
deionized water	q.s. to 100%

4,595,587
DIVISIBLE PHARMACEUTICAL TABLET WITH DELAYED ACTIVE INGREDIENT RELEASE

Bernd Zierenberg, and Arun R. Gupte, both of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 591,988, Mar. 21, 1984, Pat. No. 4,547,359. This application Jul. 3, 1985, Ser. No. 751,790

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3314003

Int. Cl.⁴ A61K *9/26, 9/44, 31/78*

U.S. Cl. 424—81 **4 Claims**

1. A pharmaceutical tablet-making composition consisting essentially of finely divided emulsion-polymerized polyacrylate material having a particle size between 10 and 500 microns, ground below the glass temperature, without the excipients, conventional tablet-making excipients and active ingredient having a molecular weight up to about 500, and a diffusion co-efficient of about 10^{-5} to 10^{-7} cm^2/hr. molecularly dispersed in said polyacrylate material.

4,595,588
NATURAL INHIBITOR THAT PROTECTS AGAINST VIRAL INFECTIONS

Samuel Baron, Dickinson, and M. Louese McKerlie, Galveston, both of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 24, 1984, Ser. No. 613,640

Int. Cl.⁴ A61K *39/00, 35/12, 49/00*

U.S. Cl. 424—89 **8 Claims**

1. A method for treating a mammal infected with a virus comprising administering to the mammal an antiviral composition comprising a therapeutically effective amount of cellular viral inhibitor having the characteristics of

(a) lacking species specificity in that the cellular viral inhibitor obtained from one species cell or tissue source is active in heterologous cells or tissue,

(b) broad antiviral activity against a number of different viruses including vaccinia virus, polio virus type I, herpes simplex virus, sindbis virus, mengo virus, influenza virus, and vesicular stomatitis virus,

(c) an apparent molecular mass ranging from about 2500 to

3000 daltons as determined by gel filtration chromatography,

(d) temperature stability between 100° C. and 4° C.,

(e) stable between pH 1 and 13 and

(f) produced spontaneously in tissue absent viral infection; together with a pharmaceutically diluent, said administered amount of the cellular viral inhibitor sufficient to elevate the concentration of said cellular viral inhibitor in the mammal's virally infected tissue above the naturally occurring concentration therein.

4,595,589

FUNGISTATIC METHOD

Risto Tahvonen, Helsinki, Finland, assignor to Kemira Oy, Helsinki, Finland

Filed Mar. 16, 1983, Ser. No. 475,805

Claims priority, application Finland, Mar. 30, 1982, 821099

Int. Cl.[4] A01N *63/00*; C12N *3/00, 1/20, 1/02*

U.S. Cl. 424—93 **14 Claims**

1. A method for controlling fungus diseases in plants which comprises:

applying at least one *Streptomyces griseoviridis* strain selected from the group consisting of ATCC 39271, ATCC 39272, and ATCC 39273 to soil, seed, or vegetation in an amount effective for controlling plant fungus diseases, said strain being indigenous to peat and being effective in controlling plant fungus diseases.

4,595,590

METHOD FOR PREVENTING OR TREATING PSEUDO-MEMBRANOUS COLITIS

Bernard Hublot, Paris, France, and René H. Levy, Seattle, Wash., assignors to Laboratoires Biocodex, Montrouge, France

Filed Jan. 17, 1984, Ser. No. 571,523

Int. Cl.[4] A61K *35/72*

U.S. Cl. 424—93 **9 Claims**

1. A method for treating pseudo-membranous colitis caused by germs of the genus Clostridium in a human patient suffering therefrom, which comprises administering to the patient a therapeutically effective amount of yeasts of the genus Saccharomyces.

4,595,591

USE OF DILUTE NITRIC ACID SOLUTIONS FOR TREATING CERTAIN SKIN LESIONS

Shalva Mardi, Binningen; Heinz F. Lichti, Riehen; Guido Baumgartner, Bettingen, all of Switzerland; Daniel Garteiz, Cincinnati, Ohio; Claude I. Judd, Loveland, Ohio, and Murray Weiner, Cincinnati, Ohio, assignors to Solco Basel AG, Basel, Switzerland

Continuation-in-part of Ser. No. 362,794, Mar. 29, 1982, abandoned, which is a continuation of Ser. No. 191,465, Sep. 26, 1980, abandoned. This application Feb. 7, 1983, Ser. No. 464,371

Claims priority, application Switzerland, Sep. 27, 1979, 8713/79

Int. Cl.[4] A61K *7/48*

U.S. Cl. 424—127 **1 Claim**

1. A method for the local treatment of human skin disease selected from the group consisting of verruca vulgaris, verruca plana, condyloma acominatum, keratosis, nevus molluscum contagiosum and of basaloma which comprises applying to said human skin an effective amount of an aqueous solution comprising

(1) nitric acid in a concentration and amount which give the solution a pH value of below 1 and an acid equivalent of from about 6 to 10 millimole/ml, and

(2) nitrous acid, in an amount corresponding to about 0.01 to 5 mg of nitrite per ml

and which, when stored at room or lower than room temperature, proves stable as regards the respective range of concentration of components 1 and 2.

4,595,592

PROCESS FOR OBTAINING LAXATIVE COMPOUNDS FROM SENNA DRUGS

Pentti Hietala, Helsinki, Finland, assignor to Dr. Madaus & Co., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 591,900, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 337,059, Jan. 5, 1982, abandoned. This application Nov. 28, 1984, Ser. No. 676,203

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 **13 Claims**

1. Process for obtaining laxative compounds from senna drug comprising

(a) extracting the senna drug with aqueous methanol by counter current percolation to obtain an extract;

(b) concentrating the extract at a temperature not greater than 50° C. until the methanol has been completely removed from the extract to form a concentrate;

(c) purifying the concentrate obtained by continuous liquid-liquid extraction with an organic solvent to obtain a purified material;

(d) transferring the purified material to a crystallization apparatus;

(e) acidifying the purified material, while stirring, to a pH of 1.5 to 2.0 to form an acidified solution;

(f) seeding the acidified solution with sennoside crystals; and

(g) separating off the crystalline crude sennoside.

4,595,593

PREPARATION FOR DEACTIVATING VIRUSES AND PROCESS FOR PRODUCING SAME

Erich Wolf, Overath; Andreas Lembke, Eutin-Sielbeck, and Rolf Deininger, Cologne, all of Fed. Rep. of Germany, assignors to Chimicasa GmbH, Chur, Switzerland

Division of Ser. No. 398,705, Jul. 15, 1982, which is a division of Ser. No. 184,135, Sep. 4, 1980, Pat. No. 4,402,950, which is a continuation of Ser. No. 5,764, Jan. 23, 1979, abandoned. This application Feb. 28, 1985, Ser. No. 706,470

Claims priority, application Luxembourg, Jan. 27, 1978, 78955

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 **16 Claims**

1. A process for preparing a pharmaceutical composition for deactivating viruses inside living human and animal organisms, comprising the steps of deriving a terpene selected from the group consisting of cinnamon flower oil and cinnamic aldehyde by steam distillation and admixing said derived terpene in a pharmaceutical carrier in a mixing ratio of terpene to carrier of from about 1:100 to about 20:100.

4,595,594

PROCESS FOR PREPARING INTENSIFIED CHEESE FLAVOR PRODUCT

Chang R. Lee, Yonkers; Chifa F. Lin, Irvington, and Nicholas Melachouris, White Plains, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 19, 1983, Ser. No. 533,821

Int. Cl.[4] A23C *9/12*

U.S. Cl. 426—35 **28 Claims**

1. A process for preparing a cheese flavor product comprising:

(a) innoculating a cheese or cheese curd prepared from milk with a gastric lipase enzyme in an amount above about 9000 International Units of lipase activity per gram of cheese or cheese curd;

(b) admixing the product of Step (a) before, during, or after innoculation or a combination thereof with an amount of cream sufficient to provide at least about 4% butterfat based on the weight of the initial cheese or cheese curd said product of steps (a) and (b) having a thinner texture than the cheese or cheese curd alone without whey;

(c) incubating the product Step (b) for a period of time sufficient to provide a product having an intensified cheese flavor; and

(d) inactivating the enzyme.

4,595,595

PROCESS FOR SIMULTANEOUS ROASTING OF NUTMEATS AND PELLICLE REMOVAL

Robert E. Gunnerson, Manteca, and Gary Jue, Fresno, both of Calif., assignors to Sun-Diamond Growers of California, Stockton, Calif.

Continuation-in-part of Ser. No. 523,812, Aug. 15, 1983, abandoned. This application Jan. 10, 1985, Ser. No. 690,568

Int. Cl.[4] A23L *1/36*

U.S. Cl. 426—438 **13 Claims**

1. A process for the removal of pellicle from pellicle-covered nut kernals having at least about 0.5% moisture by weight, said process consisting essentially of:

(a) slowly heating said pellicle-covered kernels by immersion in a heated oil at a temperature less than or equal to about 235° F. for a contact time sufficient to draw at least a portion of said moisture from the body of said kernels to the surface thereof beneath said pellicle,

(b) rapidly heating said pellicle-covered kernels to a temperature of 340° to 360° F. substantially higher than the temperature of step (a) to vaporize substantially all of said moisture from said surface regions and detach said pellicle from said kernels,

(c) abrading said pellicle-covered kernels to form a mixture comprising pellicle fragments and pellicle-free kernels, and

(d) recovering said pellicle-free kernels from said mixture.

4,595,596

CRACKERS HAVING STABILIZED SUNFLOWER SEEDS

Richard D. Fazzolare, Pearl River, N.Y., and Rudolf Windmuller, Wayne, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed May 18, 1984, Ser. No. 611,877

Int. Cl.[4] A21D *10/00*

U.S. Cl. 426—549 **5 Claims**

1. A method of making a sunflower seed containing cracker comprising:

(a) stabilizing to a moisture content between about 2 percent and about 3.5 percent a quantity of dehulled sunflower seeds by impregnating them with a high stability oil, said sunflower seeds having diameters of about 2 to 3 millimeters;

(b) blending said stabilized sunflower seeds with water and shortening;

(c) mixing said blended sunflower seeds, water, and shortening with a mixture of flour, said mixture of flour having between 15 to 25 pounds of a high gluten flour per 100 pounds of total flour to form a dough, said sunflower seeds being in a concentration of about 5 to 10 pounds per 100 pounds of total flour;

(d) machining said dough into a dough sheet;

(e) cutting said dough sheet to form a cracker shaped pieces of said sheeted dough; and

(f) baking said cut, cracker shaped pieces of dough to a moisture content between about 1 percent and about 1.7 percent whereby said crackers are rancid free and shelf stable at room temperature for up to 6 months.

4,595,597

BATTERS CONTAINING HIGH AMYLOSE FLOUR FOR MICROWAVEABLE PRE-FRIED FOODSTUFFS

Julianne M. Lenchin, Cranbury, and Harvey Bell, Martinsville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 625,384, Jun. 28, 1984, Pat. No. 4,529,604, which is a continuation-in-part of Ser. No. 531,966, Sep. 14, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,289

Int. Cl.[4] A21D *10/00*

U.S. Cl. 426—555 **7 Claims**

1. An improved batter mix for the preparation of batter coated pre-fried microwaveable foodstuffs comprising a farinaceous material selected from the group consisting of starch, flour other than high amylose flour, and mixtures thereof, wherein the improvement comprises the presence in said batter mix of about 50 to 80%, based on batter mix solids, of a high amylose flour containing at least 50% amylose, based on the starch content of said high amylose flour.

4,595,598

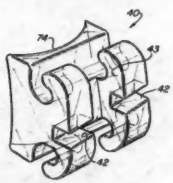
CRYSTALLINE ALUMINA COMPOSITES

Robert D. De Luca, Pennington, and Robin M. Forbes-Jones, Titusville, both of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed Apr. 23, 1984, Ser. No. 602,874

Int. Cl.[4] A01N *1/02;* **A61C** *3/00*

U.S. Cl. 427—2 **19 Claims**



1. A composite comprising a crystalline alumina article adhesively bonded to a substrate, wherein at least a portion of the surface of said article that is adhesively bonded to said substrate comprises crystalline alumina having a thin adherent coating of a siliceous material, wherein said siliceous material consists essentially of silica or a glass containing at least 50 mol percent silica.

11. A method of producing a composite which comprises the steps of coating at least a portion of the surface of a crystalline alumina article with a thin adherent coating of a siliceous material, and then bonding said article to a substrate by adhesively bonding said surface having the siliceous coating to the substrate using an adhesive that has an adhesive affinity for said siliceous coating.

4,595,599

LUMINESCENT SILANE

Roy N. Brown, Edmond, Okla.; Mike F. Stout, Longview, Tex.; Arnulf P. Hagen, Noble, and Leo Garwin, Oklahoma City, both of Okla., assignors to Advanced Chemical Technologies Company, Oklahoma City, Okla.

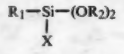
Filed Jun. 21, 1985, Ser. No. 747,414

Int. Cl.[4] B05D *5/06*

U.S. Cl. 427—5 **31 Claims**

1. A method for rendering a siliceous surface luminescent comprising:

applying to the surface an effective amount of a luminescent compound having the formula:



where R_1 is a phosphor group; where R_2 is an alkyl group containing from 1 to about 8 carbon atoms, a hydroxyalkyl group, or an alkoxyalkyl group; and where X is a phosphor group, OR_2, or a second binding site for R_1; and

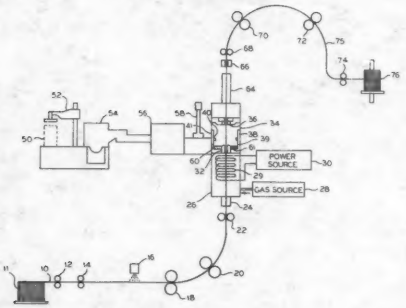
reacting the luminescent compound with an effective amount of water to hydrolyze the luminescent compound after the luminescent compound has migrated into the surface.

4,595,600

METAL CLADDING OF WIRE BY ATOMIZATION SPRAYING

James C. Keeven; Donald R. Felin, and Henry J. Fisher, all of St. Louis, Mo., assignors to FL Industries, Inc., Livingston, N.J.

Filed Nov. 13, 1984, Ser. No. 670,040
Int. Cl.[4] B21F *19/00*; B05D *1/00, 7/20*
U.S. Cl. 427—5 **21 Claims**



1. A method of cladding a metal wire with a second metal comprising the steps of:

providing a metal wire and preheating said wire in a non-oxidizing atmosphere;

spraying said preheated wire with a second metal that has been atomized in a non-oxidizing gas, and controlling the rate at which the wire passes through the spray of the second metal, the rate of the spray and the temperature defferential between the wire and the spray of the second metal such that the second metal is deposited on and bonded to the outer surface of the wire.

10. Apparatus for cladding metal wire comprising:

at atomization chamber having an inlet opening adapted to receive a preheated metal wire and an outlet adapted to pass a clad metal wire;

said atomization chamber including inlet means to permit entry of a molten metal and storage means to store said molten metal;

said atomization chamber also including a gas source and a nozzle to which said gas source is connected, and an inlet from said molten metal storage means to said nozzle;

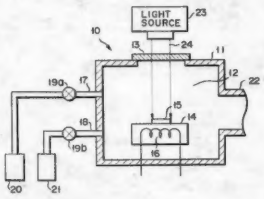
whereby said molten metal is atomized at said nozzle by said gas and is sprayed onto said metal wire moving through said atomization chamber thereby forming a clad metal coating on said metal wire.

4,595,601

METHOD OF SELECTIVELY FORMING AN INSULATION LAYER

Keiji Horioka, Kawasaki; Haruo Okano, Tokyo, and Makoto Sekine, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 20, 1985, Ser. No. 736,211
Claims priority, application Japan, May 25, 1984, 59-105999; Jul. 13, 1984, 59-144423; Jul. 13, 1984, 59-144424
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 **20 Claims**



1. A method of selectively forming an insulation layer which comprises the steps of:

exposing a workpiece whose surface layer comprises a non-insulating material to an atmosphere comprising a gaseous mixture of a halogen-based gas and a raw material gas containing an element chemically bondable with an element of said non-insulating material to form an insulating compound;

directly irradiating a light ray on a selected surface region of the workpiece through said atmosphere while heating said workpiece to a prescribed temperature, thereby dissociating said halogen-based gas; and

forming a layer comprising said insulating compound on said selected surface region of said workpiece on which said light ray has been directly irradiated.

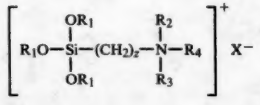
4,595,602

PROCESS FOR PREPARING OVERCOATED ELECTROPHOTOGRAPHIC IMAGING MEMBERS

Richard L. Schank, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 4, 1984, Ser. No. 647,086
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—76 **13 Claims**

1. A process for forming an overcoated electrophotographic imaging member comprising the steps of providing an electrophotographic imaging member, applying a final outer coating in liquid form comprising a cross-linkable siloxanol-colloidal silica hybrid material having at least one silicon bonded hydroxyl group per every three —SiO— units on said electrophotographic imaging member and between about 2 and about 30 percent by weight based on the weight of said cross-linkable siloxanol-colloidal silica hybrid material of a hydrolyzed ammonium salt of an alkoxy silane having the formula



wherein R_1, R_2, and R_3 are independently selected from the group consisting of aliphatic and substituted aliphatic radicals having 1 to 4 carbon atoms, R_4 is selected from the group consisting of aliphatic radicals, substituted aliphatic radicals and the group

$$-(CH_2)_y-O-\overset{O}{\overset{\|}{C}}-\overset{R_5}{\overset{|}{C}}+CH_2$$

wherein y is a number from 2 to 4, and R_5 is hydrogen or an alkyl radical, z is a number from 1 to 5 and X is an anion, said coating in liquid form having an acid number less than about 1, and curing said cross-linkable siloxanol-colloidal silica hybrid material until said siloxanol-colloidal silica hybrid material reacts with said hydrolyzed ammonium salt to form a hard cross-linked solid organosiloxane-silica hybrid polymer layer substantially free of any detectable acid and having a thickness between about 0.3 and about 3 micrometers.

4,595,603

METHOD OF MAKING DIAMOND HEATSINK ASSEMBLIES

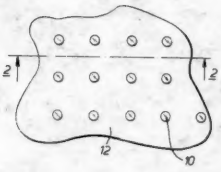
Ian Davies, and Anthony M. Howard, both of Towcester, United Kingdom, assignors to Plessey Overseas Limited, Ilford, England

Filed Oct. 24, 1984, Ser. No. 664,386

Claims priority, application United Kingdom, Oct. 25, 1983, 8328474

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—82 **4 Claims**



1. A method of making a diamond heatsink assembly, said method comprising the steps of:

securing a plurality of diamonds to a sacrificial plate,

metallising the exposed portions of the diamonds with a relatively thin layer of metal, each diamond remaining substantially unmetallised where the diamond abuts the sacrificial plate,

plating the sacrificial plate and the exposed portions of the diamond with a relatively thick layer of metal,

removing the sacrificial plate to expose only a portion of each diamond, and

dividing the layer of metal substantially enclosing the plurality of diamonds and said relatively thin layer of metal plating into a plurality of parts, each part including at least one diamond to produce a plurality of individual diamond heatsink assemblies.

4,595,604

CONDUCTIVE COMPOSITIONS THAT ARE DIRECTLY SOLDERABLE AND FLEXIBLE AND THAT CAN BE BONDED DIRECTLY TO SUBSTRATES

Frank W. Martin, Baldwin Place, and Samson Shahbazi, Yonkers, both of N.Y., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 18, 1984, Ser. No. 631,973

Int. Cl.[4] B05D *5/12*; H01B *1/02*

U.S. Cl. 427—96 **16 Claims**

1. A directly solderable and flexible conductive composition comprising from about 88% to about 95% by weight silver and a resin system comprising, based on total weight of said composition:

(a) from about 4% to about 7% by weight vinyl chloride/vinyl acetate copolymer;

(b) from about 0.25% to about 2% by weight epoxy resin; and

(c) from about 0.5% to about 3% by weight epoxy hardener; said silver being 100% in the form of flake having an average particle size from about 0.5 to about 50 microns, said vinyl chloride/vinyl acetate copolymer having a number average molecular weight from about 14,000 to 35,000 and containing no carboxylic acid groups, and said epoxy being non-aqueous-based and heat curable.

4,595,605

SOLDERABLE CONDUCTIVE COMPOSITIONS THAT ARE CAPABLE OF BEING SOLDERED BY NON SILVER-BEARING SOLDER AND THAT CAN BE BONDED DIRECTLY TO SUBSTRATES AND WHICH ARE FLEXIBLE

Frank W. Martin, Baldwin Place, and Samson Shahbazi, Yonkers, both of N.Y., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 18, 1984, Ser. No. 631,972

Int. Cl.[4] B05D *5/12*; H01B *1/02*

U.S. Cl. 427—96 **10 Claims**

1. A directly solderable conductive composition comprising after cure:

(a) from about 88 to about 93% by weight silver, said silver beiing 100% in the form of flake having an average particle size of about 0.5 to about 50 microns; and

(b) from about 7 to about 12% by weight vinyl chloride/-vinyl acetate copolymer, said copolymer having a number average molecular weight from about 14,000 to about 35, 000 and containing no carboxylic acid groups.

3. A method of making a conductive composition that is directly solderable and flexible comprising dissolving from about 5% to about 9% by weight vinyl chloride/-vinyl acetate copolymer in about 20% to about 25% by weight ketone solvent and mixing the resultant solution with about 68% to about 75% by weight silver; said vinyl chloride/vinyl acetate copolymer having a number average molecular weight from about 14,000 to about 35,000 and containing no carboxylic acid groups, and said silver being 100% in the form of flake having an average particle size of about 0.5 to about 50 microns.

4,595,606

SOLDERABLE CONDUCTIVE COMPOSITIONS HAVING HIGH ADHESIVE STRENGTH

Frank St. John, Patterson, and Samson Shahbazi, Yonkers, both of N.Y., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 18, 1984, Ser. No. 631,974

Int. Cl.[4] B05D *5/12*; H01B *1/02*

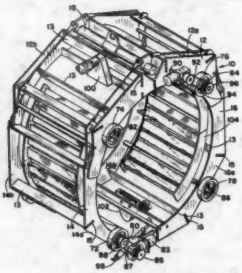
U.S. Cl. 427—96 **11 Claims**

1. A directly solderable conductive composition consisting essentially of, in combination, from about 80% to about 85% by weight silver and a resin system consisting essentially of from about 0.6% to about 1.6% by weight phenolic resin, from about 0.8% to about 1.6% by weight acrylic resin, from about 0.4% to about 0.8% by weight polyurethane resin, from about 1.2% to about 3.5% by weight vinyl chloride/vinyl acetate copolymer, from about 1.0% to about 3.0% by weight epoxy resin and from about 2.5% to about 4.0% by weight epoxy hardener; said silver being 100% in the form of flake having an average particle size from about 0.5 to about 50 microns, and said vinyl chloride/vinyl acetate copolymer having a number average molecular weight from about 14,000 to about 35,000 and containing no carboxylic acid groups.

4,595,607
COMBINED INDUCTION HEATING AND COATING SYSTEM FOR PIPE WELD JOINTS

John W. Betteridge, Essex, England; Milburn L. Hart, Tulsa, Okla.; Gregory H. Carlson, Tulsa, Okla., and Ronald E. Carlson, Sr., Tulsa, Okla., assignors to Resource Engineering and Manufacturing Corp., Tulsa, Okla.

Filed Aug. 5, 1985, Ser. No. 762,626
Int. Cl.[4] B05D *1/24*
U.S. Cl. 427—185 9 Claims



1. A process for heating and coating a section of a pipe comprising arranging a plurality of induction type heaters in spaced circumferential relation around the pipe section, the heaters having relatively flat induction coils therein disposing the coils of the induction heaters in a cylindrical surface adjacent to and parallel with the surface of the pipe, locating a coating dispenser between a pair of induction heaters for dispensing a coating material on the surface of the pipe, rotating the heaters and dispenser as a single assembly around the pipe while simultaneously applying an alternating electric potential to the induction heaters to heat the pipe to an application temperature for the coating material, continuing to rotate the assembly alternately in opposite rotary directions while heating the pipe, and thereafter applying a coating material through the dispenser to the thus-heated pipe while continuing to rotate the assembly.

5. Apparatus for heating and coating a section of a pipe comprising an articulated yoke adapted to encircle the pipe, rotating means mounted on the yoke so that the apparatus can be rotated in either direction around the pipe, a plurality of induction heaters mounted on the yoke in spaced circumferential relation, the heaters having relatively flat induction coils therein disposed in a cylindrical surface adjacent to, and parallel with, the surface of the pipe, a coating dispenser mounted on the yoke between a pair of induction heaters for dispensing a coating material on the surface of the pipe, whereby the yoke can be rotated around the pipe while simultaneously applying an alternating electric potential to the induction heaters to heat the pipe to an application temperature for the coating material, and whereby coating material can be applied thereafter to the thus-heated pipe through the dispenser while continuing to rotate the assembly.

4,595,608
METHOD FOR SELECTIVE DEPOSITION OF TUNGSTEN ON SILICON

Edward M. King, Melbourne Beach; Kurt E. Gsteiger, Indialantic, and Joseph S. Raby, W. Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

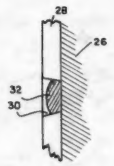
Filed Nov. 9, 1984, Ser. No. 669,787
Int. Cl.[4] B05D *7/22*; C23C *16/08*
U.S. Cl. 427—237 31 Claims

29. A method of preparing a washed tube for selective chemical vapor deposition of a first material capable of being selectively chemically vapor deposited onto a moisture free surface by exposing a substrate having an exposed portion of a second material to a vapor deposition environment comprising:

placing a quantity of said second material in said tube;

heating said tube;

flowing a gas of said first material in said heated tube to react with said second material and coat the interior of said tube;



terminating said gas flow;

removing the remaining portion of said quantity of said second material;

inserting said substrate; and

beginning said selective chemical vapor deposition process of said first material.

4,595,609
CORROSION RESISTANT TANTALUM PENTAOXIDE COATINGS

Stephen T. Wellinghoff, and Ching Lin, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Nov. 21, 1984, Ser. No. 673,865
Int. Cl.[4] B05D *3/02*; B32B *9/00, 15/04*
U.S. Cl. 427—377 13 Claims

1. A method of imparting corrosion resistance to a substrate having free surface hydroxyl groups; said method comprising:

(a) coating said surface coextensively with a partially-hydrolyzed solution of Ta[(lower)alkoxide]$_5$ in an organic solvent;

(b) evaporating said solvent to yield a tantalum oxide-ethoxide film; and

(c) curing said film to yield a uniform, amorphous tantalum pentaoxide layer on said surface.

4,595,610
CURABLE SILICONE COMPOSITIONS FOR THE PROTECTION OF POLYURETHANE FOAM

Kenneth C. Fey, Midland, and Harold V. Lefler, III, Sanford, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 2, 1984, Ser. No. 627,136
Int. Cl.[4] B32B *27/00*; B05D *5/00*; C08L *83/00, 83/04*
U.S. Cl. 428—319.3 56 Claims

1. A composition comprising the product obtained by mixing:

(A) from 1.0 to 400 parts by weight of the reaction product of

(i) an organosilicon resin consisting essentially of $R_3SiO_{\frac{1}{2}}$

units and $SiO_{4/2}$ units, wherein R represents a monovalent hydrocarbon radical, and the ratio of $R_3SiO_{\frac{1}{2}}$ units to $SiO_{4/2}$ units is from 0.6/1 to 0.9/1, and

(ii) a polyorganohydrogensiloxane;

(B) 100 parts by weight of a polydiorganosiloxane having the general formula $HO(R'_2SiO)_xH$, wherein R' represents a monovalent hydrocarbon radical and x has a value of from 10 to 1000;

(C) from 1 to 150 parts by weight of a filler; and

(D) from 0.10 to 13.3 parts by weight of an organotin catalyst.

4,595,611

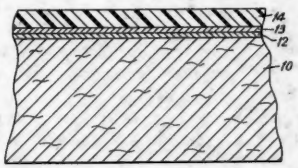
INK-PRINTED OVENABLE FOOD CONTAINERS

James R. Quick, Warwick, N.Y.; Craig A. Golden, Columbus, Ohio, and James W. Mitchell, Newburgh, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Jun. 26, 1985, Ser. No. 749,141

Int. Cl.[4] B65D *5/00;* D21H *1/22;* B32B *23/08*

U.S. Cl. 428—35 **30 Claims**



1. a method for making an ink-printed ovenable food container which comprises:

(a) printing a layer of paperboard with an ink containing a sulfonated polyester pigment binder,

(b) coating the resultant ink-printed paperboard with an unpigmented composition containing a sulfonated polyester,

(c) coating the resultant ink-printed and sulfonated polyester coated paperboard with a polyester resin sealing coating, and

(d) forming the resultant polyester resin sealed paperboard into a container.

4,595,612

LAMINATED POLYESTER CONTAINING SUBSTRATE AND COLLAPSIBLE DISPENSING CONTAINER MADE THEREFROM

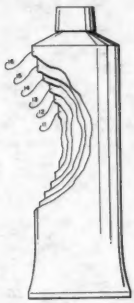
Edward A. Tavss, Kendall Park, N.J., and Samuel C. Temin, Needham, Mass., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 567,001, Dec. 30, 1983, abandoned. This application May 30, 1985, Ser. No. 739,486

Int. Cl.[4] B27N *5/02;* B32B *15/08, 15/12, 27/10*

U.S. Cl. 428—35 **15 Claims**

1. A collapsible paste dispensing container of layers of material having low flavor absorption charaterisitics comprising a first intermost layer of a polyester, a second layer of metal foil,



a third layer of paper, and an outermost fourth layer of a polyester.

4,595,613

LAMINATED FLUOROPOLYMER CONTAINING SUBSTRATE AND COLLAPSIBLE DISPENSING CONTAINER

Edward A. Tavss, Kendall Park, N.J., and Samuel C. Temin, Needham, Mass., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 567,002, Dec. 30, 1983, abandoned. This application May 31, 1985, Ser. No. 739,506

Int. Cl.[4] B65D *1/32;* B32B *27/14*

U.S. Cl. 428—35 **19 Claims**

1. A collapsible paste dispensing container having low flavor absorption characteristics comprising a first innermost layer of a fluoropolymer, a second layer of metal foil, a third layer of paper and an outermost fourth layer of a fluoropolymer.

4,595,614

METHOD AND APPARATUS FOR APPLYING INTERNAL COATINGS TO VESSELS

Erwin J. Nunlist, Penfield, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Nov. 5, 1984, Ser. No. 668,589

Int. Cl.[4] C03C *27/02;* F27B *9/14;* B05C *3/02;* B05D *7/22*

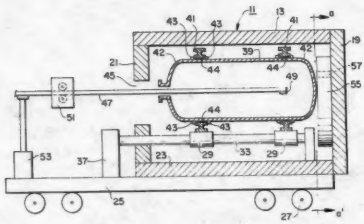
U.S. Cl. 428—35 **22 Claims**

1. A method of internally coating a substantially cylindrical vessel with a substantially continuous layer of a vitreous coating, whereby said vessel is simultaneously maintained in a substantially cylindrical shape, comprising the steps of:

(a) spacedly mounting at least two firing rings to the outside circumference of a cylindrical vessel;

(b) heating while simultaneously rotating said vessel;
(c) distributing a supply of particulate vitreous material within said vessel; while
(d) maintaining the interior of said vessel at a temperature sufficiently high to fuse said vitreous material as it is being distributed; and
(e) maintaining said vessel out of direct contact with the rotating means by use of said firing rings.

11. A furnace system for simultaneously heating and rotating a cylindrical vessel comprising:
(a) at least two firing rings adapted to be spacedly mounted around the outside circumference ofa cylindrical vessel;



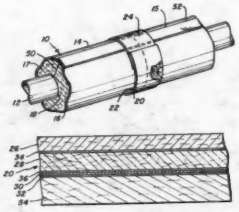
(b) a furnace body having a heating means therein, said furnace body adapted to receive said cylindrical vessel with said at least two firing rings spacedly mounted around said outside circumference of said cylindrical vessel;
(c) a plurality of rollers positioned in the button portion of said furnace body adapted to functionally contact said at least two firing rings; and
(d) means to rotate said rollers, and in turn said at least to firing rings mounted around said outside circumference of said cylindrical vessel and said cylindrical vessel.

4,595,615

PIPE INSULATION FOR COLD WEATHER APPLICATIONS

Lewis S. Cohen, Hingham, Mass., assignor to Venture Tape Corp., Rockland, Mass.

Filed Oct. 5, 1984, Ser. No. 658,120
Int. Cl.[4] B32B *27/36;* **C09J** *7/02, 7/04*
U.S. Cl. 428—36 **15 Claims**



1. An insulation system for a pipe comprising:
a first segment of insulation wrapped about the pipe and having a first end;
a second segment of insulation wrapped about the pipe, said second segment of insulation having an end adjacent to and abutting with said first end of said first segment; and
means for sealing the space between said first end of said first segment and said end of said second segment, said sealing means comprising the following layers:
a layer of paper;
a layer of woven fiberglass yarns adhesively secured to one side of said paper layer;
a metallized layer secured by a laminating adhesive to said fiberglass layer; and
a layer of pressure sensitive, isooctyl acrylate adhesive disposed on said metallized layer, said adhesive being approximately a 100% acrylate compound and having a solvent content of no greater than one half of 1%.

4,595,616

ENCAPSULATED INDUCTIVE DEVICES WITH POLYBUTADIENE ENCAPSULANT

Gordon M. Bell, Fort Wayne, and James R. Ridlen, Spencerville, both of Ind., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 349,736, Feb. 18, 1982, Pat. No. 4,485,218. This application Oct. 19, 1984, Ser. No. 662,644
Int. Cl.[4] B29B *1/04, 3/02, 3/14*
U.S. Cl. 428—68 **5 Claims**

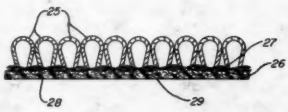
1. As an article of manufacture, an inductive device, said device being encapsulated in a cured encapsulant composition, said encapsulant composition prior to its being cured comprising:
(a) elastomeric polybutadiene of 100 parts consisting of about 54 to about 66 weight percent trans-1,4 polybutadiene, about 16 to about 24 weight percent cis-1,4 polybutadiene, and about 16 to about 24 weight percent vinyl-1,2-polybutadiene;
(b) vinyl toluene of 0 to 40 parts;
(c) trimethylol propane trimethacrylate of 0 to 10 parts;
(d) peroxide crosslinking agent of 2.5 to 5 parts;
(e) inhibitor of not substantially in excess of 0.9 parts.

4,595,617

CARPET TILES HAVING A FILLED FLEXIBLE FROTHED VINYL POLYMER BACKING AND THEIR METHOD OF MANUFACTURE

John Bogdany, Fort Oglethorpe, Ga., assignor to GenCorp Inc., Akron, Ohio

Filed May 31, 1984, Ser. No. 615,860
Int. Cl.[4] B32B *27/30;* **C08J** *9/30;* **B29C** *41/30, 67/20*
U.S. Cl. 428—95 **12 Claims**



1. The method which comprises applying to the back of a carpet a frothed aqueous compounded composition comprising
a. a latex of a vinyl polymer selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, copolymers of vinyl chloride and vinylidene chloride and copolymers of at least 50% by weight of at least one monomer selected from the group consisting of vinyl chloride and vinylidene chloride and the balance essentially at least one copolymerizable ethylenically unsaturated monomer, other than said vinyl chloride or vinylidene chloride, having from 2 to 14 carbon atoms and mixtures of said polymers,
b. an aqueous emulsified compatible plasticizer for said vinyl polymer in an amount (dry) sufficient to plasticize said vinyl polymer to achieve flexibility on fusing and
c. from about 100 to 500 parts by weight of finely divided inorganic filler per 100 parts by weight (dry) of said vinyl polymer,
heating said frothed aqueous composition to remove the water and fuse the vinyl polymer in said composition to form a frothed or cellular plasticized and filled vinyl polymer composition coating on and impregnating the back of said carpet,

compressing said carpet containing said coating of the frothed plasticized and filled vinyl polymer composition while said composition is still hot or soft to obtain a backing of uniform thickness, cooling said carpet and cutting said vinyl polymer backed carpet to form carpet tiles.

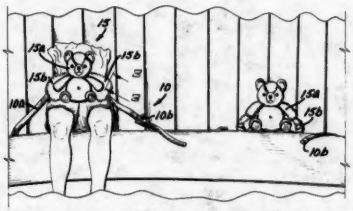
7. The product produced by the method of claim 1.

4,595,618

VEHICLE SEAT BELT ACCESSORY

Ronald L. Caringer, 448 Green Valley Dr., Chandler, Ind. 47610

Filed Jul. 6, 1984, Ser. No. 628,645
Int. Cl.[4] A41F 9/00
U.S. Cl. 428—100 1 Claim



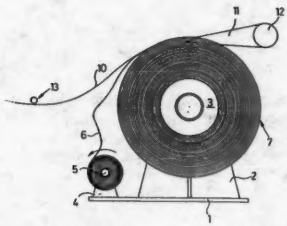
1. A child safety device for vehicular usage comprising the combination of a vehicle safety seat belt and an entertainment device, where said vehicle safety seat belt overlies the person of the child in a seated position and where said entertainment device is releasably positioned on said vehicle safety seat belt in the lap region of said child by a sleeve which is an integral part of said entertainment device and can be placed around said vehicle safety seat belt after in use condition.

4,595,619

METHOD OF AND DEVICE FOR PRODUCING BUNDLES FROM STRIP AND BUNDLE PRODUCED THEREBY

Werner Krus, Leverkusen, Fed. Rep. of Germany, assignor to Rockwell International, Downers Grove, Ill.

Filed Jun. 13, 1984, Ser. No. 620,349
Int. Cl.[4] B65H 35/02
U.S. Cl. 428—114 13 Claims



12. A composite coil comprising several adjacent bundles made out of strip with a space between them and a continuous insert in the form of a web of a separable material like paper or plastic sheet between each layer.

4,595,620

DEAD-FOLDED ARTICLES FROM FIBER-REINFORCED PLASTICS

Gaylon L. Dighton, and Jane K. McLemore, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 23, 1984, Ser. No. 633,735
Int. Cl.[4] B32B 3/04
U.S. Cl. 428—121 7 Claims

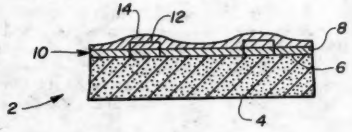
1. An article of manufacture comprising a dead-folded plastic sheet wherein said sheet comprises a densified continuous matrix prepared from a dilute aqueous slurry comprising a thermoplastic resin, said matrix having imbedded therein from about 10 to 50 percent by weight of the sheet of reinforcing fibers having an average length from about 0.06 to 1 inch, which fibers are randomly oriented in two dimensions substantially in the plane defined by said sheet and wherein said sheet is from about 1 to about 50 mils thick.

4,595,621

SIMULATED EMBOSSING ON FLOOR COVERING

James P. Valenti, Lancaster, and Eric C. Zirkel, Honey Brook, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Oct. 29, 1984, Ser. No. 665,575
Int. Cl.[4] B32B 27/04, 27/30, 31/12
U.S. Cl. 428—159 2 Claims



1. A floor covering product comprising:

(a) a base layer of vinyl material in either solid or foam construction, with or without filler material,

(b) the base layer having an upper surface and, on that surface, there being a printed decorative design on at least a part of the upper surface,

(c) a wear layer coating means covering the printed design and protecting the design from wear when the floor covering product is in use, said wear layer coating means being a two-part coating comprising:

(1) a first thicker part of 5 to 23 mils thickness of the wear layer coating means being placed on the upper surface of the base layer over at least part, but not all, of the decorative design and being in register with at least part of the decorative design, and

(2) the second thinner part of 4 to 7 mils thickness of the wear layer coating means being the same composition as the first part and being placed on the upper surface of the base layer over all the upper surface, so as to cover all the decorative design and even the first part of the wear layer coating means, whereby the wear layer coating means over part of the decorative design is composed of just the second part of the wear layer coating means and over other parts of the decorative design the wear layer coating means is composed of both the first and second parts of the wear layer coating means so that an embossed-like effect is secured.

2. A method of making a floor covering product comprising the steps of:

(a) printing a decorative design on a base layer having an upper surface which will receive the decorative design,

(b) printing the first part of a wear layer coating over at least part, but not all, of the decorative design, and

(c) applying the second part of the wear layer coating of the same composition as the first part over all the upper sur-

face so as to cover all the decorative design and even the first part of the wear layer coating whereby over part of the decorative design the wear layer is composed of just the second part of the wear layer and over other parts of the decorative design the wear layer is composed of both the first and second parts of the wear layer so that an embossed-like effect is secured and wherein the first coating is of 5 to 23 mils in thickness and the second coating is thinner and of 4 to 7 mils in thickness.

4,595,622

FELTING

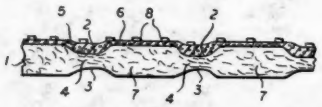
Philipp Schaefer, Hanover, Fed. Rep. of Germany, assignor to J. H. Bemecke GmbH, Fed. Rep. of Germany

Filed Mar. 6, 1985, Ser. No. 708,678

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 8406900[U]

Int. Cl.[4] B32B *3/10, 3/28, 5/16*

U.S. Cl. 428—173 **12 Claims**



1. In an embossed felting having at least one depression in at least one of its surfaces the improvement in combination therewith comprising, a plurality of hollow spheres disposed in said depression such that said depression is at least partially filled in by said spheres, said spheres being bonded together and to said felting by means of a binding agent, said spheres and binding agent thereby defining a layer, said layer being provided with a plurality of interstitial spaces such that said layer is gas permeable.

4,595,623

FIBER-REINFORCED SYNTACTIC FOAM COMPOSITES AND METHOD OF FORMING SAME

Preston S. Du Pont, Northridge; Janet E. Freeman, Pasadena; Robert E. Ritter, Palos Verdes Estates, and Alois Wittmann, Palos Verdes, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 7, 1984, Ser. No. 607,847

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—195 **39 Claims**

1. A fiber-reinforced syntactic foam composite having a specific gravity less than 1.0 and a coefficient of thermal expansion of about 25×10^{-6} in/in/°F. (45×10^{-6} cm/cm/°C.) or less and being suitable for use in the outer space environment, the composite being prepared from an admixture comprising a heat curable thermosetting resin, hollow microspheres having a diameter in the range of about 5 to about 200 micrometers and fibers having a length less than or equal to 250 micrometers.

4,595,624

SECURITY GLAZING

Thomas W. Greathead, Billericay, England, assignor to Post Office, Postal Headquarters, London, England

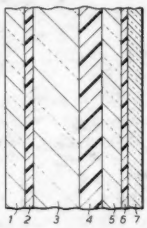
Filed Aug. 6, 1984, Ser. No. 638,111

Claims priority, application United Kingdom, Aug. 10, 1983, 8321555

Int. Cl.[4] B32B *17/10*

U.S. Cl. 428—213 **6 Claims**

1. A security glass consisting essentially of a plurality of layers of glass of at least three thicknesses, and a plurality of layers of flexible bonding material disposed alternatingly to form a laminate of greater tensile strength than the glass; wherein a layer of the flexible bonding material possesses the greater or greatest thickness of any of the layers of flexible bonding material and is positioned such that it is not the layer of flexible bonding material which is forwardmost in relation to the direction of expected impact, and wherein said laminate includes a rearmost glass layer no more than 2 mm thick which



is thinner than the glass layers forward thereof, which possesses a thickness of from 40–80% of the thickness of the next thickest glass layer and which is chemically-toughened so that said laminate substantially resists spalling from the rearmost surface when subject to impact on the frontmost surface.

4,595,625

SEALABLE MULTILAYER FILM FOR PACKAGING PURPOSES

Günther Crass, Taunusstein; Lothar Bothe, Mainz; Siegfried Janocha, Wiesbaden, and Wolfgang Dietz, Saarbruecken, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 645,625

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1983, 3331983; Jan. 31, 1984, 3403153

Int. Cl.[4] B32B *27/08, 27/32;* **B65B** *11/00*

U.S. Cl. 428—215 **12 Claims**

1. A sealable transparent multilayer film, comprising: a base layer comprised of a propylene polymer and at least one sealable layer comprised of a combination of:

(a) from about 67.5 to 89.6% by weight, relative to the weight of the sealable layer, of an olefin resin composition comprised of a co- or terpolymer of ethylene, propylene, butylene or another alpha-olefin having 5 to 10 carbon atoms or of a mixture of said polymers,

(b) from about 5 to 15% by weight, relative to the weight of the sealable layer, of a low molecular weight resin which is compatible with the olefin resin composition,

(c) from about 5 to 15% by weight, relative to the weight of the sealable layer, of a propylene homopolymer,

(d) from about 0.3 to 1.5% by weight, relative to the weight of the sealable layer, of a polydiorganosiloxane, and

(e) from about 0.1 to 1.0% by weight, relative to the weight of the sealable layer, of a silicate having the shape of platelets.

4,595,626

CONFORMABLE TILE

Mary A. Brubaker, Providence Township, Lancaster County; Wendell A. Ehrhart, and William Y. Whitmore, both of Hellam Township, York County, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jan. 28, 1985, Ser. No. 695,678

Int. Cl.[4] B05D *7/00*

U.S. Cl. 428—220 **40 Claims**

1. A conformable tile, said tile being derived from

a composition comprising by weight from about 4 to about 10 percent of a resin precursor derived from about 10 to about 60 parts by weight of monomeric diluent and from about 90 to about 40 parts by weight of an unsaturated polyester derived essentially from at least one glycol and

at least one unsaturated difunctional acid or acid derivative and, optionally, a saturated difunctional acid or acid derivative, said polyester having an end group analysis molecular weight of from about 600 to about 3600, said parts of said diluent and said polyester being based on a total of 100 parts of diluent and polyester, said resin precursor being capable of demonstrating a Shore C hardness of from about 20 to about 60 when formed in a fully cured unfilled casting;

from about 96 to about 90 percent of an inorganic aggregate material, at least 20 percent by weight of said aggregate being sufficiently small to pass through a 0.1-mm screen and at least 35 percent by weight of said aggregate being retained on a 1-mm screen; and

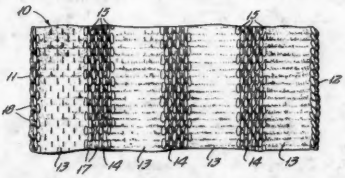
optionally, an effective amount of curing initiator, the percentage of said resin precursor and said aggregate being based on a total of 100 percent of resin precursor and aggregate.

4,595,627

FLUORESCENT TEXTILE MATERIAL

Barry Steinman, Stamford, Conn., assignor to Safety Trim Industries, Inc., New York, N.Y.

Filed Feb. 6, 1985, Ser. No. 698,679
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—241 **4 Claims**



1. As new article of manufacture a woven piece good consisting of warp and weft threads, at least some of said warp and weft threads being monofilaments of substantially square cross-section, and having at least two oppositely disposed glass-beaded reflective surfaces, further characterized in said filaments being formed by slitting a pair of bonded oppositely facing synthetic resinous sheets having a glass-beaded reflective coating on the then exposed surfaces thereof.

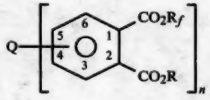
4,595,628

SOIL REPELLENT FLUORINATED ESTERS OF MULTI-RING ANHYDRIDE SYSTEMS

Michael G. Kelly, Coventry, R.I., and Willi R. Steckelberg, Hofheim, Fed. Rep. of Germany, assignors to American Hoescht Corporation, Somerville, N.J.

Continuation of Ser. No. 355,800, Mar. 8, 1982, Pat. No. 4,472,466. This application Jul. 30, 1984, Ser. No. 635,764
Int. Cl.[4] B05D *5/00*; C07C *69/76*; D06M *13/20*
U.S. Cl. 428—265 **16 Claims**

1. A compound of the formula



wherein

n is 2 or 3;

Q has a valence equal to n and is selected from the group consisting of, $(C_aH_{2a+2-n})(O_2C)_n$, $—CO(OCH_2CH_2)_bO_2C—$, $—CO_2C_6H_4O_2C—$, and $(CH_3)_2C(C_6H_4O_2C)_2$, wherein a is 2 to 6, b is 2 to 10, and n is as defined above but cannot exceed a;

R is selected from $—CH_2CH(R_1)OH$, $—CH_2CH(R_1)OCH_2CH(R_1)OH$, $—CH_2CH(OH)CH_2X$, or $—CH_2CH(OH)CH_2OCH_2CH(OH)CH_2X$ wherein R_1 is hydrogen or methyl and X is chloro, bromo, hydroxy, or cyano; and

R_f is a fluorinated radical of the formula $—W(C_dF_{2d})Y$ wherein W has from 1 to 10 carbon atoms and is selected from alkylene and $W'—Z—(W'')_e$ where W' and W'' are alkylene, Z is O, S, NHCO, or $NHSO_2$, and e is 0 or 1, Y is hydrogen, fluoro, or perfluoroalkoxy of 1 to 6 carbon atoms, and d is 2 to 20.

15. A polyester or polyamide fiber having incorporated therewith a compound of claim **1** or **11** in an amount sufficient to impart oil or water repellency.

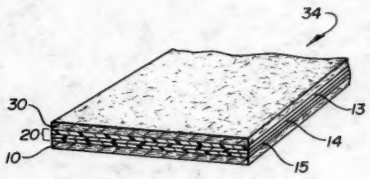
16. A process of incorporating a compound of claim **1** into the surface of a polyester or polyamide fiber which comprises contacting said compound in liquid medium with said fiber and thereafter annealing the resulting fiber at elevated temperature, the amount of said compound and the time and temperature of annealing being sufficient to impart oil or water repellency to said fiber.

4,595,629

WATER IMPERVIOUS MATERIALS

Alfred T. Mays, East Windsor, N.J., assignor to Chicopee, New Brunswick, N.J.

Division of Ser. No. 588,037, Mar. 9, 1984, Pat. No. 4,522,203. This application Jan. 7, 1985, Ser. No. 689,123
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—286 **5 Claims**



1. A water impervious laminated material comprising at least one layer of conjugate fibers, said layer of conjugate fibers having a first face and an opposite face, said conjugate fibers being composed of a lower melting component and a higher melting component, wherein a substantial proportion of the surfaces of said fibers comprises said lower melting component, said lower melting component of said conjugate fibers which lie on said first face being fuse bonded to a first layer of a plastic laminated film which comprises said first layer and at least one additional layer of plastic, said first layer of said film being thermoplastic and possessing a lower melt temperature than said additional layer of said film, said lower melting component of said fibers having been fuse bonded at a temperature below the melt temperature of said higher melting component of said fibers and said additional layer of plastic whereby the latter component retains its initial fiber-like integrity and said additional layer of plastic remains unfused and free of any perforations.

4,595,630

PROCESS FOR PRODUCING GLASS FIBER PRODUCTS AND RESULTING PRODUCT

Ralph M. Fay, Lakewood, Colo., assignor to Manville Corporation, Denver, Colo.

Filed Jun. 24, 1985, Ser. No. 748,256
Int. Cl.[4] C03C *25/02*; D04H *1/58*; B32D *27/42*
U.S. Cl. 428—288 **6 Claims**

1. An improved process for the preparation of a glass fiber

product useful as range insulation for pyrolytic self-clean oven units comprising, in order, the steps of:

(a) combining glass fibers with a heat curable binder composition, said binder composition comprising
  (i) 84–99 wt % of a phenolic resin
  (ii) 0.05–0.30 wt % of a silane
  (iii) 1.0–6.0 wt % of a suitable catalyst
  (iv) 0–15 wt % of a suitable dedusting agent;
(b) consolidating the fibers and heat curable binder into a loosely packed mass;
(c) compressing the consolidated fibers to a density no greater than about 4.0 pcf;
(d) curing said consolidated fibers at a temperature of about 350°–500° F. for about 1–10 minutes; and
(e) thereafter curing the fibers at a temperature of about 700°–1000° F. for about 10–120 seconds in an air rich atmosphere.

6. The product formed by the process of claim 1.

4,595,631

MAGNETIC RECORDING MEDIA COMPRISING CARBON BLACK-ADSORBED METAL OXIDE PARTICLES IN A MAGNETIC RECORDING LAYER

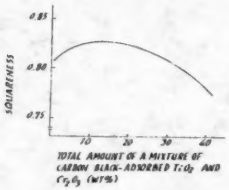
Yukio Matsumoto, Mito, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Aug. 9, 1983, Ser. No. 521,577

Claims priority, application Japan, Aug. 10, 1982, 57-137892; Sep. 21, 1982, 57-163102

Int. Cl.[4] G11B *5/706*

U.S. Cl. 428—323 **5 Claims**



1. A magnetic recording medium comprising a support, and a magnetic recording layer formed on at least one side of said support, said magnetic recording layer being made of a dispersion, in a resin binder, of magnetic particles and non-magnetic particles of a carbon black-adsorbed metal oxide which is selected from the group consisting of aluminum oxide in an amount of 0.5 to 30 wt% of the magnetic particles, titanium dioxide in an amount of 0.5 to 30 wt% of the magnetic particles, chromium (III) oxide in an amount of 0.5 to 15 wt% of the magnetic particles, and mixtures thereof, wherein, when the particles are mixtures of carbon black-adsorbed titanium dioxide and carbon black-adsorbed aluminum oxide, they are present in the total amount of 0.5 to 30 wt% of said magnetic particles; when the particles are mixtures of carbon-black adsorbed titanium dioxide and carbon-black adsorbed chromium (III) oxide, they are used in the total amount of 0.5 to 30 wt% of said magnetic particles provided that said chromium (III) oxide is used in an amount from 0.5 to 15 wt%; and when the particles are mixtures of particles of carbon black-adsorbed aluminum oxide and carbon black chromium (III) oxide, they are used in the total amount of from 0.5 to 30 wt% of said magnetic particles provided that said chromium (III) oxide is used in an amount of from 0.5 to 15 wt%, and wherein said carbon black powder has an average size below 100 millimicrons and a surface area of above 30 m^2/g and is adsorbed in an amount of from 0.5 to 20 wt% based on the weight of the non-magnetic metal oxide particles.

4,595,632

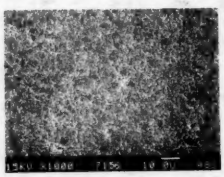
FLUOROCARBON GRAFTING OF POLYMERIC SUBSTRATES

Kenneth G. Mayhan, Irvine, Calif.; Robert A. Janssen, Eden Prairie, Minn., and Roger F. Drake, Costa Mesa, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 6, 1984, Ser. No. 577,300

Int. Cl.[4] B32B *27/28, 25/16*

U.S. Cl. 428—409 **23 Claims**



1. An article comprising a preformed solid or semi-solid polymeric substrate containing carbon-carbon groups joined by double bonds, said substrate having a surface covered by a lubricious hydroxy-fluorocarbon graft bonded to said carbon-carbon groups at said surface and comprising hydroxy and fluoroester linkages pendant from the respective carbons of each of said surface groups, said linkages substantially eliminating the carbon-carbon double bonds at said surface and being hydrolytically stabilized by intramolecular hydrogen bonding.

4,595,633

COMPOSITION

Willem L. Sederel, Roosendaal, and Petrus C. A. M. van Abeelen, Gilze, both of Netherlands, assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jun. 18, 1984, Ser. No. 621,805

Claims priority, application Netherlands, Sep. 6, 1983, 8302686

Int. Cl.[4] B32B *15/08, 27/36, 27/38*

U.S. Cl. 428—412 **15 Claims**

1. An information carrier for optically readable information built up from a carrier of polycarbonate resin and a reflective metal layer provided thereon, wherein the polycarbonate resin consists of a mixture of 90–99.99% by weight of an aromatic polycarbonate, 0.01–0.5% by weight of an epoxy compound and 0–9.99% by weight of additives usual for polycarbonate resins.

4,595,634

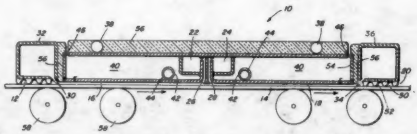
COATING PROCESS FOR MAKING NON-IRIDESCENT GLASS

Roy G. Gordon, c/o Thompson, Birch, Gauthier & Samuels, 225 Franklin St., Boston, Mass. 02110

Filed Aug. 1, 1983, Ser. No. 519,248

Int. Cl.[4] B32B *9/00*

U.S. Cl. 428—428 **4 Claims**



1. In a structure formed of at least one transparent glass sheet and comprising thereon a first inorganic coating of an infra-red reflective material which material is of the type that is a transparent semiconductor and normally exhibits iridescent colors

in daylight illumination, and wherein an interlayer coating is between said glass and said first coating, and said interlayer coating forms means to substantially diminish iridescent colors of said first coating by providing at least two additional interfaces which form means, together with the mass of interlayer coating, to reflect and refract light such that the observability, in daylight illumination, of said iridescent colors is substantially reduced; and wherein said interlayer coating has a average refractive index defined as about the square root of the multiple of the refractive indices of said glass and said first coating, wherein said interlayer coating is comprised of two sublayers each having an optical thickness of about ¼ wavelength of light having a vacuum wavelength of about 500 nanometers, and wherein the sublayer of higher refractive index is most remote from the glass, the improvement wherein at least one sublayer contains at least a part of its thickness wherein its refractive index falls as distance from the glass underlayer increases.

4,595,635

ORGANOPOLYSILOXANE MATERIALS HAVING DECREASED SURFACE TACK

Robert S. Dubrow, Redwood City; Catherine A. Dittmer, Mountain View, and William D. Uken, Fremont, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 2, 1985, Ser. No. 730,692
Int. Cl.[4] B05D *3/06*
U.S. Cl. 428—447 **20 Claims**

1. A method of reducing the surface tack of crosslinked organopolysiloxane materials having cone penetration between about 100 and about 350 (10^{-1} mm) and ultimate elongation at least about 100% which comprises:

applying to the surface of said material an effective amount of an organic peroxide or a photoinitiator; and

irradiating the surface with ultraviolet light to effect a further crosslinking of the surface of said material to reduce the surface tack thereof without effecting significant further crosslinking of said material below said surface.

15. An organopolysiloxane material having cone penetration between about 100 and about 350 (10^{-1} mm) and ultimate elongation of at least 100% and having reduced surface tack formed by:

applying to the surface of said material an effective amount of an organic peroxide or a photoinitiator; and

irradiating the surface with ultraviolet light to effect a further crosslinking of the surface of said material to reduce the surface tack thereof without effecting significant further crosslinking of said material below said surface.

18. A substrate having disposed thereon a material according to claim 15.

4,595,636

BITUMEN ADHESIVE COMPOSITION CONTAINING AN IONOMERIC ELASTOMER AND WATERPROOFING MEMBRANES COMPRISING SAME

Robert A. Wiercinski, Somerville, and Stephen J. Whicher, Wakefield, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Apr. 17, 1985, Ser. No. 724,000
Int. Cl.[4] B32B *11/00*
U.S. Cl. 428—489 **24 Claims**

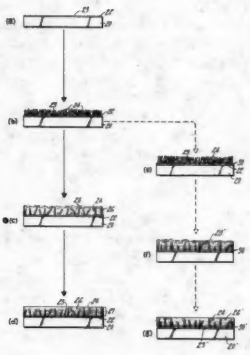
1. A pressure sensitive adhesive composition comprising bitumen, an oil which is not naturally occurring in said bitumen and is selected from the group consisting of naphthenic oils, paraffinic oils, and aromatic oils, and an ionomeric elastomer.

4,595,637

PLASMA COATINGS COMPRISED OF SPRAYED FIBERS

Harry E. Eaton, Woodstock, and Richard C. Novak, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 322,132, Nov. 17, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,668
Int. Cl.[4] B32B *7/00, 15/14*
U.S. Cl. 428—608 **21 Claims**



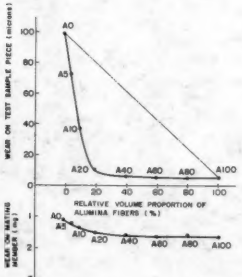
1. An article comprising a substrate having a surface to which are adhered a multiplicity of fibers, the fibers having been partially melted during thermal spraying thereof onto the surface, the fibers bonded to the surface by the portions thereof which have been melted; and, matrix material spaced apart from the surface of the substrate to provide a gap between the matrix and the surface.

4,595,638

COMPOSITE MATERIAL MADE FROM MATRIX METAL REINFORCED WITH MIXED ALUMINA FIBERS AND MINERAL FIBERS

Tadashi Dohnomoto, and Masahiro Kubo, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 16, 1985, Ser. No. 734,654
Claims priority, application Japan, Mar. 1, 1985, 60-040908
Int. Cl.[4] B32B *5/02, 7/00*
U.S. Cl. 428—614 **16 Claims**



1. A composite material, consisting essentially of:

(a) a reinforcing material which is a hybrid fiber mixture material consisting essentially of:

(a1) an effective amount of a reinforcing alumina fiber

material with the principal components being at least about 80% by weight of Al_2O_3 and the remainder substantially SiO_2; and

(a2) an effective amount of a reinforcing mineral fiber material having as the principal components SiO_2, CaO, and Al_2O_3, the content of included MgO therein being less than or equal to about 10% by weight, the content of included Fe_2O_3 therein being less than or equal to about 5% by weight, and the content of other inorganic substances included therein being less than or equal to about 10% by weight, with the percentage of non-fibrous particles included therein being less than or equal to about 20% by weight, and with the percentage of non-fibrous particles with diameters greater than about 150 microns included therein being less than or equal to about 7% by weight; and

(b) a matrix metal selected from the group consisting of aluminum, magnesium, copper, zinc, lead, tin, and alloys having these metals as principal components; and wherein the volume proportion of said hybrid fiber mixture material in said composite material is at least 1%.

4,595,639

RADIOGRAPHIC INTENSIFYING SCREEN

Etsuo Shimizu, Tokyo; Yuji Aoki; Yujiro Suzuki, both of Odawara, and Norio Miura, Isehara, all of Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,885

Claims priority, application Japan, Sep. 9, 1983, 58-165055; Sep. 16, 1983, 58-169357

Int. Cl.⁴ B32B *9/00*; C09K *11/475*

U.S. Cl. 428—690 **6 Claims**

1. A radiographic intensifying screen, comprising:

(a) a support; and

(b) a fluorescent layer formed on the support, said fluorescent layer consisting essentially of a rare earth oxysulfide phosphor of the formula:

$$(Ln_{1-x-y-z}, Tb_x, Ho_y, A_z)_2O_2S$$

wherein Ln is at least one element selected from the group consisting of La, Gd, Y and Lu, A is at least one element selected from the group consisting of Pr, Er and Yb, x, y and z are numbers within the ranges of $0.001 \leqq x \leqq 0.02$, $0.0001 \leqq y \leqq 0.01$ and $0 \leqq z \leqq 0.01$, respectively, and $x \geqq y+z$.

4,595,640

LUBRICANT SYSTEM FOR MAGNETIC RECORDING MEDIA CONTAINING ISOMERIC ACIDS OR ALCOHOLS

John G. Chernega, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 27, 1983, Ser. No. 565,415

Int. Cl.⁴ G11B *5/72*

U.S. Cl. 428—695 **13 Claims**

1. A magnetic recording medium comprising: a backing; a magnetizable layer containing a magnetizable material on said backing; and a lubricant comprising both an organic compound selected from the group consisting of isomers of carboxylic acids having about 12 to 30 carbon atoms per molecule and a fatty acid ester having about 12 to 40 carbon atoms in its molecules.

4,595,641

BATTERY COMPARTMENT HAVING BATTERY POLARITY PROTECTION

Joel F. Giurtino, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 21, 1985, Ser. No. 736,570

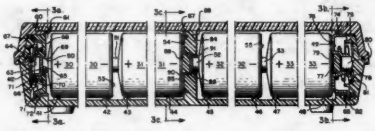
Int. Cl.⁴ H01M *2/10*

U.S. Cl. 429—1 **17 Claims**

1. A battery compartment for receiving therein one or more elongate electrochemical battery cells of the type having dimensionally dissimilar terminals of opposite electrical polarity at opposite ends, comprising:

a housing defining a battery receiving chamber for receiving one or more of the electrochemical battery cells in series connected end-to-end stacked relation;

electrical contact means at one end of said chamber for electrically engaging the most adjacent terminal of the most adjacent cell received in said chamber when said most adjacent terminal is a predetermined one of said dissimilar terminals, and for preventing electrical engagement to said adjacent terminal when said adjacent terminal is the other of said dissimilar terminals; and



additional electrical contact means at the opposite end of said chamber for electrically engaging the other of said dissimilar terminals;

said electrical contact means at one end of said chamber including a first contact surface arranged to engage the predetermined one of said dissimilar terminals and a first insulating region overlying at least a portion of that portion of said first contact surface not in contact with said predetermined dissimilar terminal;

said additional electrical contact means including a second contact surface arranged to engage the other of said dissimilar terminals and a second insulating region centrally located on said second contact surface.

4,595,642

FUEL CELL COMPOSITE PLANT

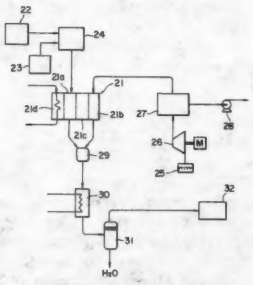
Kenichi Nakanishi; Seiichi Tanabe, both of Tokyo, and Jun Izumi, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Toyko, Japan

Filed Sep. 5, 1985, Ser. No. 772,751

Claims priority, application Japan, Sep. 14, 1984, 59-193638

Int. Cl.⁴ H01M *8/06*; C01B *23/00*

U.S. Cl. 429—19 **2 Claims**



1. A fuel cell composite plant characterized by comprising a fuel cell, a device for feeding a fuel gas to an anode of said fuel cell, a gas separator for feeding a high-purity oxygen gas containing argon to a cathode of said fuel cell, a combustor for burning unreacted gases from said anode and said cathode, and a cooling device for condensating and removing water from a burned gas in order to obtain an argon gas.

4,595,643

AIR CELL ELECTRODE AND PROCESS FOR PREPARING ITS CATALYST

Nobuharu Koshiba, Nara; Hayashi Hayakawa, Osaka; Keigo Momose, Osaka, and Akira Ohta, Osaka, all of Japan, assignors to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00234, § 371 Date Nov. 19, 1984, § 102(e) Date Nov. 19, 1984, PCT Pub. No. WO84/03799, PCT Pub. Date Sep. 27, 1984

PCT Filed Jul. 21, 1983, Ser. No. 681,418

Claims priority, application Japan, Mar. 18, 1983, 58-46247

Int. Cl.[4] H01M *4/00, 4/86*

U.S. Cl. 429—27 14 Claims

1. An air cell including a catalyst comprising a manganese oxide whose X-ray diffraction peaks corresponding to its lattice constants have the characteristics of Mn_5O_8 and whose chemical analysis for MnOx satisfies the condition $1.45x \leqq 1.60$.

4,595,644

PHOTOCONDUCTIVE MEMBER OF A-SI(GE) WITH NONUNIFORMLY DISTRIBUTED NITROGEN

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,245

Claims priority, application Japan, Sep. 12, 1983, 58-168546; Sep. 13, 1983, 58-170382; Dec. 27, 1983, 58-244737; Dec. 27, 1983, 58-244741; Dec. 28, 1983, 58-245304; Dec. 28, 1983, 58-245316

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—57 96 Claims

1. A photoconductive member which comprises a substrate for a photoconductive member and a light receiving layer constituted of an amorphous material containing silicon atoms and germanium atoms and exhibiting photoconductivity, the light receiving layer having a layer region (N) containing nitrogen atoms ununiformly in the direction of layer thickness, the distribution concentration curve of nitrogen atoms in the direction of layer thickness being smooth, and the maximum distribution concentration being present within the light receiving layer.

4,595,645

PHOTOCONDUCTIVE MEMBER HAVING a-Ge-AND a-Si LAYERS WITH NONUNIFORMLY DISTRIBUTED OXYGEN

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,229

Claims priority, application Japan, Oct. 31, 1983, 58-205190; Dec. 8, 1983, 58-232058

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—84 42 Claims

1. A photoconductive member comprising a substrate for a photoconductive member and a light receiving layer provided on said substrate having a layer in which a layer region (G) comprising an amorphous material containing germanium atoms and at least one of hydrogen atoms and halogen atoms and a layer region (S) exhibiting photoconductivity comprising an amorphous material containing silicon atoms and at least one of hydrogen atoms and halogen atoms are successively provided from the substrate side, and (2) a second layer which is constituted of an amorphous material comprising silicon atoms and at least one of carbon atoms and nitrogen atoms, said first layer containing oxygen atoms and having a first layer region, a third layer region and a second layer region, with oxygen atom distribution concentration in the layer thickness direction of C(1), C(3), and C(2), respectively, in the order mentioned from the substrate side with a proviso that C(3) does not solely take the maximum value and when either one of C(1) and C(2) is zero, the other two are not zero and not equal to each other, or when C(3) is zero, the other two are not zero, or when none of C(1), C(2), and C(3) is zero, C(1), C(2), and C(3) cannot be equal simultaneously and C(3) cannot solely take the maximum value.

4,595,646

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Kazuo Tsubuko, and Junichiro Hashimoto, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,265

Claims priority, application Japan, Dec. 6, 1982, 57-213669

Int. Cl.[4] G03G *9/12*

U.S. Cl. 430—115 9 Claims

1. A liquid developer for electrophotography comprising a highly electrically insulating carrier liquid having a low dielectric constant and a colorant comprising a pigment component prepared by treating pigment particles with an effective amount of a humic acid component selected from the group consisting of humic acid, a humic acid salt and a humic acid derivative, and then coating said pigment particles with a resin component, said colorant being dispersed in said highly electrically insulating carrier liquid.

4,595,647

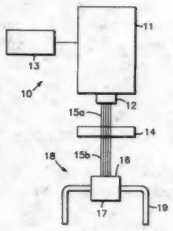
METHOD FOR ENCAPSULATING AND MARKING ELECTRONIC DEVICES

Keith G. Spanjer, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 1, 1985, Ser. No. 697,183

Int. Cl.[4] B05D *3/06;* B01J *13/02;* H01L *21/265;* B23K *26/00*

U.S. Cl. 430—138 10 Claims



1. A method for encapsulating laser markable devices comprising:

providing an internal assembly;

placing said internal assembly in a mold;

providing a molding compound comprising a plastic resin containing a powdered filler material and a coloring material, wherein said filler material comprises silicon oxide or aluminum oxide or a mixture of silicon oxide and aluminum oxide, and wherein said coloring material includes titanium dioxide powder in the range 1–5% by weight and carbon black powder in the range 0–3% by weight; and

encapsulating a portion of said internal assembly with said molding compound.

4,595,648

RADIATION-SENSITIVE PLATES FORMED USING DIAZONIUM SALTS

Michael Stanton, Garforth; Allen P. Gates, Knaresborough, and Rodney M. Potts, Garforth, all of England, assignors to Vickers Limited, London, United Kingdom

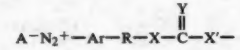
Division of Ser. No. 216,963, Dec. 16, 1980, abandoned. This application Sep. 11, 1984, Ser. No. 649,486

Claims priority, application United Kingdom, Dec. 18, 1979, 794359

Int. Cl.[4] G03C *1/54*

U.S. Cl. 430—162 **13 Claims**

1. A radiation sensitive plate comprising a substrate coated with a radiation sensitive compound containing at least two groups having the structure



in which Ar represents a divalent or other polyvalent radical derived from an aromatic or heteroaromatic compound; X and X′ are different and each represents O, S or an imino group, provided that one of X and X′ is an imino group; Y represents O or S; R represents a single bond or a divalent or other polyvalent radical and A^- is an anion.

11. A radiation sensitive plate as claimed in claim **1** wherein said substrate is formed of aluminum.

4,595,649

GLASSY TiO_2 POLYMER FILMS AS ELECTRON BEAM CHARGE DISSIPATION LAYERS

Susan A. Ferguson, W. Seneca, and Roland L. Chin, Williamsville, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 19, 1985, Ser. No. 703,058

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—296 **6 Claims**

1. In a method for the manufacture of a semiconductor device in which a spin on resist layer is applied to the device substrate, wherein the substrate is exposed to charged particles to generate a pattern on the substrate and wherein the resist layer is developed, the improvement comprising:

(a) applying to the substrate by spin-on deposition, a layer of TiO_2 glassy polymer composition; and

(b) exposing the thus coated semiconductor substrate to a beam of charged particles.

4,595,650

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Nobuo Furutachi; Masakazu Morigaki, and Takeshi Hirose, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1984, Ser. No. 632,738

Claims priority, application Japan, Jul. 20, 1983, 58-132134

Int. Cl.[4] G03C *7/16*

U.S. Cl. 430—387 **17 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having coated thereon at least one silver halide emulsion layer, the color photographic light-sensitive material having a photographic layer containing at least one kind of magenta coupler of 5-pyrazolone type having an arylthio group at the coupling position thereof, the arylthio group having an alkoxy group or an aryloxy group at the ortho position to the sulfur atom thereof and the alkoxy group and the aryloxy group being substituted with a cyano group, a halogen atom, a sulfonyl group, a sulfinyl group, a phosphonyl group, or an

group, wherein A represents a chemical bond, an alkylene group, an arylene group, an oxygen atom, a sulfur atom, or an imino group; and B represents a hydroxy group, an alkoxy group, an aryloxy group, a hydrogen atom, an alkyl group, an aryl group, an acyclic amino group, or a hydrazino group; or wherein A and B are bonded to each other to form a ring together with

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4,595,651

PROCESS FOR PRODUCING EQUIDENSITY IMAGES USING PHOTOHARDENABLE MATERIALS

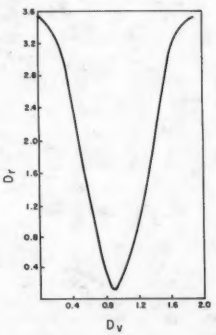
Mario Grossa, Dreieich, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 6, 1984, Ser. No. 647,809

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335309

Int. Cl.[4] G03C *5/00, 5/16*

U.S. Cl. 430—394 **6 Claims**



1. A process for photographic recording of selective areas of an original image on a layer of photohardenable material comprising (a) a nongaseous, ethylenically unsaturated monomeric compound, (b) an organic photoinitiator or photoinitiator/sensitizer system sensitive in visible light, and (c) a photoinhibitor activatable by ultraviolet radiation taken from the class consisting of nitroso dimers and o-nitroaromatic compounds, the process comprising, in either order, (A) exposing the photohardenable layer with radiation of a wavelength range which desensitizes the exposed areas, (B) photohardening the layer by exposure with radiation of a wavelength range which hardens the layer, the improvement wherein recording of the image is accomplished by two imagewise exposures through the same original image with radiation of different wavelengths (A) and (B), with the proviso that when the first imagewise exposure is the photohardening exposure a nonimagewise photohardening final exposure follows the second imagewise exposure.

2. A process according to claim **1** wherein the imagewise exposures are carried out through a continuous tone original and the recorded selected ranges represent equidensities.

4,595,652

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL WITH POLYMERIC BASE PRECURSOR

Taku Nakamura; Akira Hibino, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 30, 1985, Ser. No. 760,435
Claims priority, application Japan, Jul. 30, 1984, 59-159947
Int. Cl.[4] G03C *1/40, 1/06*
U.S. Cl. 430—559 16 Claims

4. A heat-developable light-sensitive material as claimed in claim 1, which additionally contains light-sensitive silver halide and a dye providing substance represented by the formula (CI):

$$(Dye—X)_q—Y \qquad (CI)$$

wherein Dye represents a dye which becomes mobile when released from the molecule; X is a bond or a connecting group selected from the group consisting of —NR— (wherein R is a hydrogen atom, an alkyl group, or a substituted alkyl group), $—SO_2—$, —CO—, an alkylene group, a substituted alkylene group, a phenylene group, a substituted phenylene group, a naphthylene group, a substituted naphthylene group, —O—, —SO—, and a group obtained by combining together two or more of the above groups; Y is a group which permits the release of Dye in negative or positive relation to a latent image formed imagewise in a light-sensitive silver salt; and q represents an integer of 1 or 2.

4,595,653

PROCESS FOR ASSAYING CELLULAR IMMUNITY

Lee H. Kronenberg, San Diego, Calif., assignor to Lee BioMolecular Research Laboratories, Inc., San Diego, Calif.

Division of Ser. No. 269,557, Jun. 9, 1981, Pat. No. 4,568,542.
This application Mar. 6, 1985, Ser. No. 709,062
Int. Cl.[4] C12Q *1/70*
U.S. Cl. 435—5 14 Claims

1. A process for assaying cellular immunity which comprises (a) incubating lymphocytes with inactivated, non-infective virus-containing normal cells or tumor cells having cell associated antigens capable of eliciting an immunological response and having had DNA or RNA contained therein covalently bonded to psoralen or a psoralen derivative in the presence of long wave-length ultraviolet light, and (b) measuring the amount of lymphocyte proliferation.

8. A process for assaying cellular immunity which comprises (a) incubating lymphocytes with labelled, inactivated, non-infective virus-containing normal cells or tumor cells having cell associated antigens capable of eliciting an immunological response and having had DNA or RNA contained therein covalently bonded to psoralen or a psoralen derivative in the presence of long wave-length ultraviolet light, and (b) measuring the amount of cytolysis of said cells.

4,595,654

METHOD FOR DETECTING IMMUNE COMPLEXES IN SERUM

Rudolph P. Reckel, Bridgewater; Joanne L. Harris, Annandale; Ralph Wellerson, Jr., Basking Ridge; Sally M. Shaw, Somerville, and Paul M. Kaplan, Sergeantsville, all of N.J., assignors to Immunomedics Inc., Newark, N.J.

Filed Nov. 7, 1983, Ser. No. 549,105
Int. Cl.[4] G01N *53/00, 33/564;* C12N *5/00;* C07K *15/04*
U.S. Cl. 435—7 19 Claims

1. An IgG mouse antibody, produced by a mouse lymphocyte:myeloma hybridoma cell, which specifically binds to human Clq and human Clq containing complexes but which substantially does not bind to human Cl.

8. A metod for detection or determination of a human Clq-containing complex in a fluid suspected to contain said complex which comprises:

(a) providing a mouse monoclonal antibody of the IgG class and produced by a mouse lymphocyte:myeloma hybridoma cell and capable of specifically binding to human Clq and human Clq-containing complexes, but not detectably bind to human Clq, said antibody being attached to a solid phase;

(b) contacting a sample of said fluid with said solid phase under conditions to permit an immunological reaction between said human Clq-containing complex and said anti-human-Clq monoclonal antibody;

(c) separating the unreacted fluid sample from the solid phase;

(d) contacting said solid phase with a labelled second antibody capable of binding to Clq complex which may be bound to the solid phase under conditions to permit an immunological reaction between said second antibody and said bound complesx;

(e) separating unreacted second antibody from the solid phase; and

(f) detecting or determining said label on either said solid phase or said unreacted second antibody and relating said detection or determination to the presence or quantity of Clq-containing complex in said fluid sample.

4,595,655

ASSAY METHOD AND REAGENT THEREFOR

Colin H. Self, 46 Lensfield Road, Cambridge, United Kingdom

Continuation of Ser. No. 193,647, Oct. 3, 1980, abandoned. This application Dec. 9, 1982, Ser. No. 448,369
Claims priority, application United Kingdom, Oct. 3, 1979, 7934376; Mar. 3, 1981, 8110031; Mar. 7, 1981, 8107249; Apr. 1, 1981, 8110233
The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.
Int. Cl.[4] G01N *33/54;* C12Q *1/32*
U.S. Cl. 435—7 36 Claims

1. In a method of determining a ligand or receptor in solution which comprises an assay wherein:

(a) the presence of said ligand or receptor in said solution causes a conjugate in a solution to become matrix bound, said conjugate comprising a ligand or receptor labelled with an enzyme;

(b) the matrix bound conjugate is separated from unbound conjugate, and

(c) the matrix bound or the unbound conjugate is assayed,

the improvement which comprises:

(d) contacting the conjugate to be assayed with a precursor for a modulator for a cyclic chemical reaction whereby said modulator is produced as a result of reaction of label and precursor for the modulator, and

(e) contacting the thus produced modulator with the components of a cyclic chemical reaction which is activated by the modulator, which cyclic chemical reaction interconverts said modulator and its reduced or oxidized form and which cyclic chemical reaction thereby regenerates the modulator produced by the conjugate and produces a determinable change, said components of the cyclic chemical reaction being present in sufficient quantity to maintain the cyclic chemical reaction and produce determinable product as the cyclic chemical reaction proceeds, whereby amplification occurs.

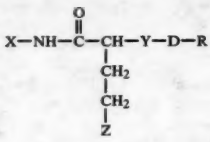
4,595,656

COUPLING AGENTS AND PRODUCTS PRODUCED THEREFROM

Stephen D. Allen, Park City, Utah, and Michael Thompson, Evansville, Ind., assignors to Becton Dickinson & Company, Paramus, N.J.

Filed Jan. 6, 1984, Ser. No. 568,698
Int. Cl.[4] G01N *33/53, 33/549, 33/533;* A61K *49/00*
U.S. Cl. 435—7 18 Claims

1. A compound having the following structural formula:

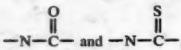


wherein

one of R and X is a ligand and the other of R and X is selected from the group consisting of detectable markers, solid supports and therapeutic drugs and when one of R and X is a therapeutic drug, the other of R and X is an antibody,

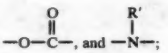
Z is selected from the group consisting of —SH and —OH

Y is selected from the group consisting of



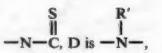
when Y is

D is selected from the group consisting of —O—, —S—,



and

when Y is



and R' is selected from the group consisting of hydrogen and hydrocarbon radicals.

12. The compound of claim 1 wherein one of R and X is a detectable marker and the other of R and X is a ligand selected from the group consisting of antigens, haptens and antibodies.

4,595,657

PROCESS FOR PREPARING AN INHIBITING AGENT AGAINST PROLIFERATION OF ANIMALS MALIGNANT TUMOR CELLS

Tomoyuki Tajima, Ichikawa, Japan, assignor to Koken Ltd., Tokyo and Youichiro Nagasu, Kanagawa, both of, Japan

Filed Feb. 23, 1984, Ser. No. 583,011

Claims priority, application Japan, May 6, 1983, 58-78300

Int. Cl.[4] C12P *1/00, 21/00*

U.S. Cl. 435—41 **2 Claims**

1. A process for preparing an inhibiting agent against the proliferation of human renal carcinoma cells comprising cultivating human renal carcinoma cells from said culture medium, and successively isolating a fraction from the culture medium having a molecular weight not less than 500 by fractional filtration, said fraction inhibiting the proliferation of human renal carcinoma cells.

4,595,658

METHOD FOR FACILITATING EXTERNALIZATION OF PROTEINS SYNTHESIZED IN BACTERIA

Norman D. Zinder; Peter Model, both of New York, N.Y., and Jef D. Boeke, Cambridge, Mass., assignors to The Rockefeller University, New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 416,922

Int. Cl.[4] C12P *21/00, 21/06, 21/02, 21/04;* **C12N** *15/00, 1/20, 1/02, 1/00;* **C12R** *1/19*

U.S. Cl. 435—68 **20 Claims**

1. A method for facilitating externalization of proteins transported to the periplasmic space of an *E. coli* bacterium, comprising:

culturing in an appropriate culture medium an *E. coli* bacterium containing (a) an f1 bacteriophage gene III or gene III fragment coding or gene III protein or a polypeptide fragment thereof capable of causing a perturbation of the outer membrane of the bacterium such that other proteins transported to the periplasmic space selectively leak from the bacterium and (b) a first DNA sequence coding for the other protein operatively attached to a second DNA sequence coding for a suitable leader capable of mediating transport of the other protein to the periplasmic space, wherein the bacterium is capable of replacing the gene III or gene III fragment and the DNA sequences, and is capable of expressing sufficient amounts of the gene III protein or polypeptide fragment thereof to cause the perturbation, and wherein the other protein is a genetically engineered fusion protein.

4,595,659

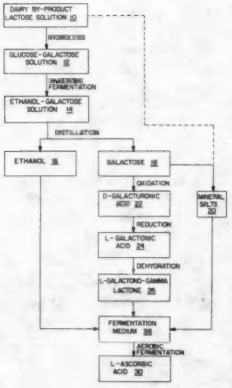
FERMENTATION PRODUCTION OF ASCORBIC ACID FROM L-GALACTONIC SUBSTRATE

John F. Roland, Glenview, Ill.; Theodore Cayle, Fox Point, Wis.; Robert C. Dinwoodie, Glenview, and David W. Mehnert, Lake Villa, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Oct. 20, 1983, Ser. No. 543,975

Int. Cl.[4] C12N *1/32;* **C12P** *7/62, 7/60;* **C12R** *1/72*

U.S. Cl. 435—135 **15 Claims**



1. A process for the manufacture of L-ascorbic acid comprising the steps of

providing an aqueous fermentation medium comprising an L-galactonic substrate selected from the group consisting of L-galactonic acid, lower alkyl L-galactonic acid esters, L-galactono-gamma-lactone and mixtures thereof, and a carbon energy source selected from the group consisting of ethanol, glycerol and mixtures thereof,

providing in said fermentation medium a microorganism which is overproductive in L-ascorbic acid synthesis from

said substrate and which utilizes said carbon energy source, wherein said microorganism is a Candida yeast or an L-ascorbic acid overproductive mutant strain thereof, and

culturing said microorganism under aerobic conditions to consume said carbon energy source and to accumulate L-ascorbic acid.

4,595,660

MOLECULAR CLONING WITH BIFUNCTIONAL PLASMID VECTORS IN *BACILLUS SUBTILIS*, MUTANTS AND SUBSTANTIALLY STABLY TRANSFORMED MUTANTS OF *BACILLUS SUBTILIS*, AND METHODS FOR UTILIZING THE TRANSFORMED MUTANTS

Gary R. Ostroff, Needham, Mass., and Jacques J. Pène, Newark, Del., assignors to University of Delaware, Newark, Del.

Filed Mar. 2, 1983, Ser. No. 471,789

Int. Cl.⁴ C12R *1/125*; C12N *15/00, 1/20, 1/00*; C12P *21/00*

U.S. Cl. 435—172.3 **8 Claims**

1. A biologically pure culture of a spontaneous mutant of the MI 112 strain of *Bacillus subtilis*, said mutant being identified by the Bacillus Genetic Stock Center culture number BGSC 1A510.

4,595,661

IMMUNOASSAYS AND KITS FOR USE THEREIN WHICH INCLUDE LOW AFFINITY ANTIBODIES FOR REDUCING THE HOOK EFFECT

Linda K. Cragle, San Diego; Paul C. Harris, Yorba Linda; Shih-Yun Lee, San Marcos; Ker-Kong Tung, Carlsbad, and Morton A. Vodian, Escondido, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 18, 1983, Ser. No. 553,219

Int. Cl.⁴ G01N *33/546, 33/53, 33/543*; C12Q *1/00*

U.S. Cl. 436—534 **20 Claims**

1. A one-step sandwich immunoassay for an antigenic substance (Ag) in a fluid, said immunoassay being of the type comprising:

(a) contacting said fluid with (i) a soluble, labeled antibody ($L\text{-}Ab_a$) to said Ag and (ii) an antibody (Ab_b) to said Ag bound to a solid carrier (SC) to form an insoluble complex ($L\text{-}Ab_a\text{-}Ag\text{-}Ab_b\text{-}SC$);

(b) separating said $L\text{-}Ab_a\text{-}Ag\text{-}Ab_b\text{-}SC$ from said fluid and unreacted $L\text{-}Ab_a$; and

(c) measuring either the amount of $L\text{-}Ab_a$ associated with said $L\text{-}Ab_a\text{-}Ag\text{-}Ab_b\text{-}SC$ or the amount of unreacted $L\text{-}Ab_a$; characterized in that in step (a) said fluid is also contacted with at least one additional entity selected from the group consisting of at least one different type of soluble, labeled antibody ($L\text{-}Ab_c$) to said Ag and at least one different type of antibody (Ab_d) to said Ag bound to a solid carrier (SC_1);

wherein:

(i) each type of $L\text{-}Ab_c$ and $Ab_d\text{-}SC_1$ has a lower average affinity constant (K) for said Ag than each respective K of $L\text{-}Ab_a$ and $Ab_b\text{-}SC$;

(ii) said additional entity is present in an amount sufficient to avoid a hook effect; and

(iii) said SC_1 is selected from the group consisting of said SC, at least one different solid carrier (SC_2), and mixtures thereof (SC and SC_2).

12. A reagent of the type comprising:

(a) a soluble, labeled antibody ($L\text{-}Ab_a$) to an antigenic substance (Ag); and

(b) an antibody (Ab_b) to said Ag bound to a solid carrier (SC);

characterized in that said reagent further comprises at least one additional entity selected from the group consisting of at least one different type of soluble, labeled antibody ($L\text{-}Ab_c$) to said Ag and at least one different type of antibody (Ab_d) to said Ag bound to a solid carrier (SC_1);

wherein:

(i) each type of $L\text{-}Ab_c$ and $Ab_d\text{-}SC_1$ has a lower average affinity constant (K) for said Ag than each respective K of $L\text{-}Ab_a$ and $Ab_b\text{-}SC$;

(ii) said additional entity is present in an amount sufficient to avoid a hook effect when said reagent is employed in an immunoassay; and

(iii) said SC_1 is selected from the group consisting of said SC, at least one different solid carrier (SC_2), and mixtures thereof (SC and SC_2).

4,595,662

CERAMIC MATERIAL FOR A HONEYCOMB STRUCTURE

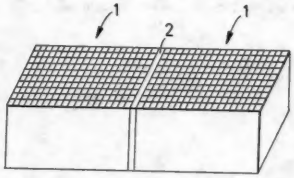
Shigeru Mochida, Kasugai; Shunichi Yamada, Nagoya, and Toshiyuki Hamanaka, Suzuka, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 26, 1984, Ser. No. 686,397

Claims priority, application Japan, Dec. 28, 1983, 58-249787

Int. Cl.⁴ C03C *8/24*; C04B *35/18*

U.S. Cl. 501—15 **7 Claims**



1. A ceramic material for joining, coating or sealing a honeycomb structure, comprising, per 100 parts by weight, a first mixture of 40 to 90 parts by weight of cordierite powder and 10 to 60 parts by weight of crystalline glass powder having a crystalline phase consisting essentially of a solid solution of β-spodumene, said first mixture having a chemical composition consisting essentially of 51.5 to 64.4% by weight of SiO_2, 24.8 to 33.7% by weight of Al_2O_3, 5.5 to 12.4% by weight of MgO and 0.4 to 2.7% by weight of Li_2O, said first mixture being fired to result in a fired body, said fired body having crystalline phases comprising at least 90 weight percent of a crystalline phase of said cordierite and said solid solution of β-spodumene and not more than 10 weight percent total of crystalline phases of mullite and a solid solution of phases selected from the group consisting of β-quartz, protoenstatite and mixtures thereof, said fired body having a coefficient of thermal expansion of not greater than 1.8×10^{-6}/°C. at a temperature of 40°–800° C.

4,595,663

SINTERED CERAMIC SHAPED ARTICLE WHOLLY OR PREDOMINANTLY OF EUTECTIC MICROSTRUCTURE CONSTITUENTS

Ulrich Krohn, Leonberg; Hans Olapinski, Aichwald, and Ulf Dworak, Baltmannsweiler, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 271,216, Jun. 8, 1981, abandoned. This application Jan. 9, 1984, Ser. No. 569,394

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022213

Int. Cl.⁴ C04B *35/00, 35/48*

U.S. Cl. 501—103 **2 Claims**

1. In a sintered ceramic shaped article in the form of cutting tools, turbine blades, and similar articles which exhibit excellent hardness wear properties and bending strength, formed by sintering or hot pressing a mixture of dense, non-metallic, mechanically resistant ceramic powders, the improvement

which comprise said mixture consisting wholly or predominantly of eutectic microstructures selected from the group consisting of aluminum oxide/zirconium oxide, beryllium oxide/zirconium oxide, aluminum oxide/hafnium oxide, aluminum oxide/zirconium oxide/ytterbium oxide, aluminum oxide/hafnium oxide/yttrium oxide, aluminum oxide/hagnium oxide/ytterbium oxide, aluminum oxide/zirconium oxide/yttrium oxide, aluminum oxide/magnesium oxide/zirconium oxide, and aluminum oxide/magnesium oxide/hafnium oxide and wherein particles of zirconium oxide and hafnium oxide within the eutectic microstructures are in an extremely fine and homogenous distribution and are present to a substantial extent in a metastable tetragonal modification.

4,595,664

BURNER SKELETON

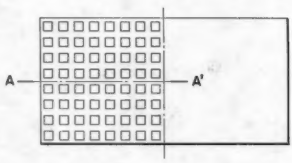
Atsushi Nishino, Neyagawa; Kunio Kimura, Hirakata; Yasuhiro Takeuchi, Hirakata, and Koji Ishihara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 9, 1984, Ser. No. 578,756

Claims priority, application Japan, Feb. 16, 1983, 58-24990; Jul. 18, 1983, 58-131239

Int. Cl.[4] C04B *35/02*

U.S. Cl. 501—124 **8 Claims**



1. A burner skeleton consisting essentially of, as principal constituents, a silica compound, and calcium aluminate as a binder; and further containing 3 to 40 wt % of titanium oxide, said calcium aluminate containing 15 to 40 wt % of lime, 35 to 80 wt % of alumina and 0.3 to 20 wt % of iron oxide.

4,595,665

HIGH ALUMINA SINTERED BODY

Hiroshi Takayama, and Hiroshi Maruyama, both of Kokubu, Japan, assignors to Kyocera Corporation, Japan

Filed Nov. 6, 1984, Ser. No. 668,652

Claims priority, application Japan, Nov. 7, 1983, 58-209353

Int. Cl.[4] C04B *35/18;* **C03C** *10/04;* **B32B** *9/04*

U.S. Cl. 501—128 **12 Claims**

1. A high alumina sintered body composed of a substrate consisting substantially of α-Al_2O_3 and a surface layer of mullite precipitated in situ on the substrate, wherein α-Al_2O_3 and a glass phase are present in the mullite surface layer, said sintered body being obtained by molding and sintering at a temperature at or above about 1400° C. a composition consisting essentially of 75 to 95% by weight of α-Al_2O_3 and 3 to 10% by weight of SiO_2 as main components, 1 to 10% by weight of a mullite mineralizing agent selected from the group consisting of TiO_2, ZrO_2, Fe_2O_3, MnO_2, MoO_2, Ce_2O_3 and mixtures thereof 0.3 to 1% by weight of B_2O_3, and 0.4 to 3% by weight of at least one of MgO and CaO.

4,595,666

CATALYST REJUVENATION PROCESS FOR REMOVAL OF METAL CONTAMINANTS

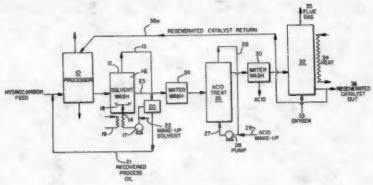
Partha S. Ganguli, Lawrenceville, N.J., assignor to HRI, Inc., Gibbsboro, N.J.

Continuation-in-part of Ser. No. 317,216, Nov. 2, 1981, Pat. No. 4,454,240. This application Apr. 30, 1984, Ser. No. 605,537

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.[4] B01J *21/20, 23/94, 23/92;* **C10G** *1/06*

U.S. Cl. 502—26 **9 Claims**



1. A catalyst rejuvenation process for removing metal contaminants of iron, titanium, calcium, sodium, vanadium and nickel from particulate hydrogenation catalysts used in coal liquefaction and petroleum residua conversion processes, comprising:

(a) washing the used catalyst containing metals and carbon deposits with a hydrocarbon solvent to remove process oils;

(b) treating the oil-free catalyst with an aqueous solution consisting of sulfuric acid solution and an ammonium ion which converts the metal contaminants to their respective sulfate compounds and at a temperature within the range of 60°–250° F. for at least about 5 minutes to remove the metal contaminants from the catalysts; and

(c) washing the treated catalyst to remove the aqueous solution, thereby providing a rejuvenated catalyst containing substantially all the carbon deposits of the used catalyst.

6. A catalyst rejuvenation process for removing metal contaminants of iron, titanium, calcium, sodium, vanadium and nickel from particulate hydrogenation catalysts used in a process for upgrading hydrocarbons, comprising:

(a) washing the used catalyst containing metal and carbon deposits with a hydrocarbon solvent to remove process oils;

(b) washing the oil-free catalyst with water to substantially fill the catalyst pores with water;

(c) treating the catalyst having pores substantially water filled with an aqueous acid solution which removes the metal contaminants and at a temperature within the range of 60°–250° F. for at least about 5 minutes to remove metal contaminants from the catalyst; and

(d) washing the treated catalyst with a polar solvent to remove the aqueous solution, thereby providing a rejuvenated catalyst containing substantially all the carbon deposits of the used catalyst.

8. A catalyst rejuvenation process for removing metal contaminants of iron, titanium, calcium, sodium, vanadium and nickel from particulate hydrogenation catalysts used in a process for upgrading hydrocarbon feed materials, the process comrising;

(a) washing the used catalyst containing metals and carbon deposits with a hydrocaron solvent to remove process oils;

(b) treating the oil-free catalyst with a 5–10 W% aqueous solution of ammonium peroxydisulfate which converts the metal contaminants to their respective sulfate compounds at a temperature within the range of 60° to 150° F. for at least about 5 minutes to remove the metal contaminants from the catalyst; and

(c) washing the treated catalyst to remove the aqueous solution, thereby providing a rejuvenated catalyst containing substantially all the carbon deposits of the used catalyst.

4,595,667

CATALYST FOR THE HYDROTREATING OF HEAVY HYDROCARBON OILS

Shinji Takase; Akira Inoue; Tatuo Omata, all of Yokohama; Masao Mori, Yokosuka; Yoshihiro Yamazaki, and Tatsuki Kubo, both of Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,821

Claims priority, application Japan, Apr. 27, 1984, 59-83648

Int. Cl.[4] B01J *21/16*

U.S. Cl. 502—63 **14 Claims**

1. A catalyst for the hydrotreating of heavy hydrocarbon oils, comprising a double structure including a porous core (1), made chiefly of alumina, which possesses micropores having an average size smaller than 170 angstrom and has at least one active metal carried thereon, and a surface layer (2) made mainly of at least one clay mineral selected from the group consisting of sepiolite, halloysite, attapulgite, palygorskite and asbestos.

2. The catalyst according to claim 1, wherein the micropores have an average size of from 40 to 150 angstrom.

7. The catalyst according to claim 1, wherein the at least one active metal is a transition metal of Group Vb, VIb, VIII or Ib of the Periodic Table and is used in an amount of from 0.1 to 20 wt.% of the total weight of the core and the surface layer, calculated as the metallic element.

4,595,668

BOUND ZEOLITE CATALYST

Kenneth R. Poeppelmeier, Edison; Walter G. Funk, Mountainside; John J. Steger, Pittstown; Shun C. Fung, Bridgewater; Virginia R. Cross, and Jar-Lin Kao, both of Houston, all of Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 10, 1983, Ser. No. 550,952

Int. Cl.[4] B01J *29/30*

U.S. Cl. 502—66 **23 Claims**

1. A catalyst comprising a binder and a type L zeolite containing at least one Group VIII noble metal the particles of the at least one noble metal being well dispersed over the surface of the catalyst, and at least 90% of the at least one noble metal associated with the zeolite is dispersed in the form of particles having a diameter of less than about 7 Å as measured by bright field imaging on a scanning transmission electron microscope with 4 Å point-to-point resolution.

2. The catalyst of claim 1 wherein the binder is derived from boehmitic alumina or a kaolin.

6. The catalyst of claim 1 wherein the zeolite has exchangeable cations of which at least 75% are selected from the group consisting of lithium, sodium, potassium, cesium, calcium, and barium cations.

4,595,669

METHOD OF PREPARING AN IMPROVED CATALYST

Shun C. Fung, Bridgewater, and Samuel J. Tauster, Englishtown, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 10, 1983, Ser. No. 550,902

Int. Cl.[4] B01J *29/30*

U.S. Cl. 502—74 **27 Claims**

1. A process for preparing an improved type L zeolite reforming catalyst containing at least one Group VIII noble metal which comprises:

(a) improving the dispersion of the at least one noble metal by oxychlorination;

(b) removing excess chlorine from the catalyst and stabilizing the dispersion of the at least one noble metal in the catalyst; and

(c) reducing the dispersed at least one noble metal.

3. The process of claim 1 wherein the catalyst is contacted in step (b) with a gas stream comprising a mixture of steam and oxygen.

20. A catalyst comprising a type L zeolite containing at least one Group VIII noble metal, characterized in that the particles of the at least one noble metal are well dispersed over the surface of the catalyst and at least 90% of the noble metal after reduction is dispersed in the form of particles having a diameter of less than about 7 Å as measured by bright field imaging on a scanning transmission electron microscope with 4 Å point-to-point resolution.

4,595,670

ZEOLITE CATALYST

Samuel J. Tauster, Englishtown; Angelo A. Montagna, Summit; John J. Steger, Pittstown; Shun C. Fung, Bridgewater, all of N.J., and Virginia R. Cross, Houston, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 10, 1983, Ser. No. 550,889

Int. Cl.[4] B01J *29/30*

U.S. Cl. 502—74 **28 Claims**

1. A catalyst comprising a type L zeolite containing at least one Group VIII noble metal from the Periodic Table of Elements, characterized in that the particles of the noble metal are well dispersed over the surface of the catalyst, and at least about 90% of the noble metal, prior to reduction and after calcination thereof, is dispersed in the form of particles having a diameter of less than about 7 Å as measured by bright field imaging on a scanning transmission electron microscope with 4 Å point-to-point resolution.

2. The catalyst of claim 1 wherein at least 90% of the at least one noble metal is inside the channels of the catalyst and at least 90% of the at least one noble metal inside the channels is dispersed in the form of particles having a diameter of less than about 7 Å as measured by bright field imaging on scanning transmission electron microscope with a 4 Å point-to-point resolution.

5. The catalyst of claim 1 wherein the zeolite contains exchangeable cations of which at least 75 percent are selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, calcium, and barium cations.

4,595,671

PEROXIDE COMPOSITIONS BASED ON TUNGSTEN AND PHOSPHORUS OR ARSENIC, AND PROCESSES AND USES RELATIVE THERETO

Carlo Venturello; Rino D'Aloisio, and Marco Ricci, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Division of Ser. No. 550,620, Nov. 10, 1983, Pat. No. 4,562,276.

This application Sep. 30, 1985, Ser. No. 781,749

Claims priority, application Italy, Nov. 10, 1982, 24154 A/82

Int. Cl.[4] B01J *31/06*

U.S. Cl. 502—159 **2 Claims**

1. An epoxidation catalyst for olefines, fixed on a polymeric macroporous polystyrenic or silicone resin, characterized in that said catalyst is prepared by reaction of an oxygenated derivative of tungsten, an oxygenated derivative of an element chosen from amongst P and As, and hydrogen peroxide, contained in an acid aqueous phase, with an "onium" salt fixed on a macroporous polymeric polystyrenic or silicone resin.

4,595,672

METHOD OF MAKING SELF-PROMOTED HYDROTREATING CATALYSTS

Teh C. Ho, Bridgewater, and Larry E. McCandlish, Highland Park, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 603,834, Apr. 25, 1984, abandoned, which is a continuation of Ser. No. 454,220, Dec. 29, 1982, abandoned. This application Dec. 11, 1984, Ser. No. 680,379

Int. Cl.[4] B01J *27/047, 31/00, 27/051;* C10G *1/06*

U.S. Cl. 502—219 7 Claims

1. A process for preparing a supported, self-promoted catalyst, said process comprising:

(i) compositing a porous, inorganic refractory oxide support with a water soluble catalyst precursor salt characterized by (ML) $(Mo_yW_{1-y}O_4)$ wherein M comprises one or more divalent promoter metals selected from the group consisting of Mn, Fe, Co, Ni, Cu, Zn and mixtures thereof, wherein y is any value ranging from 0 to 1, and wherein L is one or more neutral, nitrogen-containing ligands at least one of which is a chelating polydentate ligand; and

(ii) heating said composite formed in (i) in a non-oxidizing atmosphere in the presence of excess sulfur in the form of one or more sulfur bearing compounds and at a temperature of at least about 200° C. to form said self-promoted catalyst.

4,595,673

DEHYDROGENATION CATALYST COMPOSITIONS AND METHOD OF THEIR PREPARATION

Tamotsu Imai, Mount Prospect, and Hayim Abrevaya, Chicago, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 29, 1984, Ser. No. 676,444

Int. Cl.[4] B01J *21/04, 23/58, 23/62*

U.S. Cl. 502—227 17 Claims

1. A catalytic composite comprising a platinum component, a tin component and an alkali component on alumina, wherein the alkali component comprises from about 0.05 to 2.0 wt. %, on the weight of the composite, of lithium and from about 0.05 to about 3.0 wt. %, on the weight of the composite, of potassium.

4,595,674

HOMOLOGUES OF APROTININ WITH, IN PLACE OF LYSINE, OTHER AMINOACIDS IN POSITION 15, PROCESS FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Harald Tschesche, Bielefeld; Herbert Wenzel, Muelheim; Rainer Schmuck, Bielefeld, and Eugen Schnabel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 627,943, Jul. 5, 1984. This application Mar. 13, 1985, Ser. No. 711,340

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327277; Nov. 3, 1983, 3339693

Int. Cl.[4] A61K *37/64;* C07K *7/10*

U.S. Cl. 514—9 18 Claims

1. A homolog of aprotitin in which the lysine residue in position 15 in the active centre of the aprotinin inhibitor has been replaced by one of the residues of the aminoacids glycine, L-alanine, L-valine, L-leucine, L-isoleucine, L-methionine, L-arginine, L-α-aminobutyric acid, L-norvaline, L-norleucine, dehydroalanine and L-homoserine.

4,595,675

BICYCLIC α-IMINOCARBOXYLIC ACID COMPOUNDS HAVING HYPOTENSIVE ACTIVITY

Rolf Geiger, Frankfurt am Main; Volker Teetz, Hofheim am Taunus; Bernward Schölkens, Kelkheim, and Hans Wissmann, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

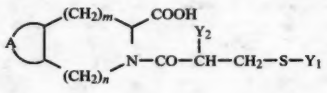
Continuation-in-part of Ser. No. 520,227, Aug. 5, 1983, abandoned, which is a continuation of Ser. No. 188,228, Sep. 17, 1980, abandoned, and Ser. No. 534,392, Sep. 22, 1983, abandoned, which is a continuation of Ser. No. 324,141, Nov. 23, 1981, abandoned. This application Jan. 2, 1985, Ser. No. 688,325

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937779; Nov. 21, 1979, 2946909; Nov. 25, 1980, 3044236

Int. Cl.[4] C07D *5/06;* A61K *37/02*

U.S. Cl. 514—10 15 Claims

1. Compound of the formula I



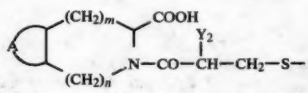
(I)

in which

n denotes 0 or 1, m denotes 1 or 2, but $(n+m) \leqq 2$,

A together with the bridgehead carbon atoms denotes a benzene or a cyclohexane ring,

Y_1 denotes hydrogen, $(C_1–C_6)$-alkanoyl or $(C_5–C_8)$-cycloalkanoyl, benzoyl or a radical of the formula II,



(II)

or, if

A is part of a benzene ring then Y_1 is as defined 20 above or denotes nicotinoyl, and

Y_2 denotes amino, $(C_1–C_6)$-alkanoylamino, $(C_5–C_8)$-cycloalkanoylamino or benzoylamino,

or, if A is part of a benzene ring then Y_2 is as defined above or denotes nicotinoylamino.

14. A method for treating hypertension which comprises administering to a patient afflicted with hypertension a hypotensively effective amount of a compound as in claim 1.

4,595,676

RAT HYPOTHALAMIC GRF

Joachim Spiess, Encinitas; Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Apr. 26, 1983, Ser. No. 488,748

Int. Cl.[4] C07K *7/10;* A61K *37/43*

U.S. Cl. 514—12 26 Claims

1. A synthetic peptide having the formula: H-R_1-Ala-Asp-Ala-Ile-Phe-Thr-R_8-Ser-R_{10}-Arg-R_{12}-R_{13}-Leu-R_{15}-Gln-Leu-R_{18}-Ala-Arg-Lys-Leu-Leu-R_{24}-R_{25}-Ile-R_{27}-R_{28}-Arg-Gln-Gln-Gly-Glu-R_{34}-Asn-Gln-Glu-R_{38}-R_{39}-R_{40}-Arg-R_{42}-R_{43}-R_{44}-Y wherein R_1 is Tyr, Met, Leu, D-Tyr, D-His or His; R_8 is Ser or Asn; R_{10} is Tyr or D-Tyr; R_{12} is Arg or Lys; R_{13} is Ile or Val; R_{15} is Gly or D-Ala; R_{18} is Tyr or Ser; R_{24} is His or Gln; R_{25} is Glu or Asp; R_{27} is Met, Ala, Nle, Ile, Leu or Val; R_{28} is Asn or Ser; R_{34} is Arg or Ser; R_{38} is Gln or Arg; R_{39} is Arg or Gly; R_{40} is Ser or Ala; R_{42} is Phe or Ala; R_{43} is Asn or Arg; R_{44} is a natural amino acid or des-R_{44}; and Y represents the carboxyl moiety of the amino acid residue at the C-terminus and is the radical —COOR,—CRO,—CONHNHR, —CON(R)(R′) or —CH_2OR, with R and R′ being lower alkyl, fluoro lower alkyl or hydrogen, or a fragment thereof extending from the N-terminus in a continu-

ous sequence to a residue in position 27 through 42 at its C-terminus, which fragment is biologically active to cause the release of GH from the pituitary, or a nontoxic salt thereof provided however that any one of the following is present, R_8 is Ser, R_{12} is Arg, R_{13} is Ile, R_{18} is Tyr, R_{24} is His, R_{25} is Glu, R_{28} is Asn, R_{34} is Arg, R_{38} is Gln, R_{39} is Arg, R_{40} is Ser, R_{42} is Phe or R_{43} is Asn.

4,595,677

SUBSTITUTED TETRAPEPTIDES

Bernhard Riniker, Frenkendorf; Peter Bühlmayer, Arlesheim, and Walter Fuhrer, Frenkendorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

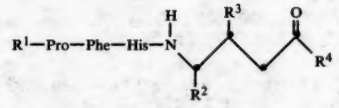
Filed Nov. 23, 1983, Ser. No. 554,735

Claims priority, application Switzerland, Dec. 3, 1982, 7047/82; Jul. 1, 1983, 3635/83

Int. Cl.[4] C07K *7/02;* A61K *37/02*

U.S. Cl. 514—17 17 Claims

1. Compounds of the formula



wherein R^1 represents the radical H-Pro-His-, H-Ile-His- or H-Arg-Arg-, R^2 represents 2-methylpropyl, R^3 represents hydroxy, R^4 represents the radical -Val-Tyr-Lys-OH, -Ile-His-Lys-OH, -Ile-His-Ser-OH, -Val-Tyr-Ser-OH, -Val-Tyr-OH, -Ile-His-OH, -Val-Tyr-NH_2, -Ile-His-NH_2 or -Ala-Sta-OH, or such radical wherein the amino acid residue -Ile- is replaced by -β-Ala- or the residue -Val-, -Ile- or -Ala- replaced by -Lac- or -OCH_2CO-, and a compound wherein the carboxy and amino groups in R^1 and R^4 are protected by pharmaceutically acceptable protecting groups, and pharmaceutically acceptable salts of these compounds.

4,595,678

N-SUBSTITUTED PSEUDO-AMINOSUGARS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Satoshi Horii, Sakai; Yukihiko Kameda, Kanazawa, and Hiroshi Fukase, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

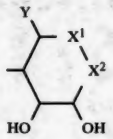
Filed Mar. 15, 1983, Ser. No. 475,615

Claims priority, application Japan, Mar. 19, 1982, 57-45345; Jun. 10, 1982, 57-100325; Oct. 19, 1982, 57-183433; Nov. 22, 1982, 57-204936

Int. Cl.[4] A61K *31/73;* C07H *5/06*

U.S. Cl. 514—53 24 Claims

13. (2) A compound as claimed in claim 1, wherein B is a group of the formula:



wherein X^1 and X^2 both are represented by

or wherein one of X^1 and X^2 is oxygen while the othere is

or wherein X^1 and X^2 combine to form —O— Y is 1 a lower alkyl group of 1 to 4 carbon atoms which may have a hydroxyl substituent, 2 a hydroxyl group, or 3 an amino group; and Z is hydrogen, a hydroxyl group, a hydroxymethyl group or an amino group.

4,595,679

INSECTICIDAL COMPOSITIONS UTILIZING 2-PYRROLIDONES HAVING ENHANCED INSECT KNOCKDOWN CHARACTERISTICS

David J. Broadbent, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 23, 1984, Ser. No. 674,399

Int. Cl.[4] A01N *47/10, 53/00, 57/00, 65/00*

U.S. Cl. 514—67 5 Claims

1. An insecticidal composition in liquid medium comprising:

(a) an active insecticide selected from the group consisting of "pyrethrins, propoxur and pyrethrins and piperonyl butoxide" present in an amount sufficient to kill the housefly and cockroach common to a household;

(b) a liquid vehicle present in an amount sufficient to solubilize, disperse, or emulsify said active insecticide; and

(c) a knockdown promoter of said housefly and said cockroach consisting of N-vinyl 2-pyrrolidone, said knockdown promoter being present in an amount of 0.1% to 50%, said knockdown promoter acting as a potentiation agent for the insecticide.

4,595,680

PHARMACEUTICAL COMPOSITIONS AND METHOD FOR PREPARING PHOSPHATIDYLSERINE COMPOSITIONS USEFUL IN TREATING CENTRAL NERVOUS SYSTEM DISORDERS WITHOUT EFFECTS ON BLOOD COAGULATION

Francesco della Valle, Padua, and Aurelio Romeo, Rome, both of Italy, assignors to FIDIA, S.p.A., Abano Terme, Italy

Filed Apr. 12, 1984, Ser. No. 599,341

Claims priority, application Italy, Nov. 17, 1983, 49355 A/83

Int. Cl.[4] A61K *31/685*

U.S. Cl. 514—77 21 Claims

1. A pharmaceutical composition comprising an effective dopaminergic control modulation amount of phosphatidylserine and phosphatidylethanolamine, together with a pharmaceutically acceptable carrier, diluent or excipient wherein said phosphatidylserine is present in an amount of from 60 to 75 weight percent, and said phosphatidylethanolamine is present in an amount of from 40 to 25 weight percent, said composition being substantially free of secondary hematic coagulation effects said composition being prepared by the process comprising:

extracting phosphatidylserine from animal brain tissue;

extracting phosphatidylethanolamine from animal brain tissue; and

combining about 60 to 75 weight percent of said phosphatidylserine with about 40 to 25 weight percent of said phosphatidylethanolamine extract in an appropriate solvent.

4,595,681

ANTIHYPERTENSIVE NEUTRAL LIPID

Fred L. Snyder, and Merle L. Blank, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 26, 1984, Ser. No. 665,214

Int. Cl.[4] A61K *31/22, 33/42*

U.S. Cl. 514—77 3 Claims

1. A method for treating a warm-blooded animal comprising

administering to said animal a neutral glycerolipid with a 12 to 20 carbon alkyl group at the sn-1 position, a short carbon chain acyl group at the sn-2 position and a hydroxyl group at the sn-3 position in an amount sufficient to lower the arterial blood pressure of said animal.

3. A method for treating a warm-blooded animal comprising administering a composition consisting essentially of a 1-alkyl-2-acetyl (or propionyl)-sn glycerol in combination with a 1-alkyl-2-acetyl-sn-glycero-3-phosphocholine, wherein the 1-alkyl groups contain 12 to 20 carbon atoms, dissolved in an inert pharmaceutically acceptable solvent in amounts sufficient to lower the arterial blood pressure of said animal.

4,595,682

TRICYCLOPHOSPHAZENE DERIVATIVES, AND THEIR APPLICATION AS CANCER CHEMOTHERAPEUTIC DRUGS

Jean-Francois Labarre, Toulouse; Guy Guerch, Castanet; Gaston Levy, Balma, and Francois Sournies, Ramonville St Agne, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

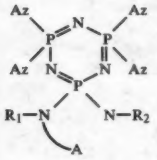
Filed Nov. 23, 1983, Ser. No. 554,812

Claims priority, application France, Nov. 25, 1982, 82 19768

Int. Cl.[4] C07D *203/06;* **A61K** *31/395*

U.S. Cl. 514—83 **9 Claims**

1. A compound of the formula I:



in which

Az is 1-aziridinyl,

A is a straight or branched chain alkylene, alkenylene or alkynylene having 1 to 5 carbon atoms, which may be substituted by halo, imino, and amino, and which may be interrupted by —S— or —O—, and

R_1 and R_2, independently of each other, are hydrogen, straight or branched chain alkyl having 1 to 7 carbon atoms, alkenyl having 2 to 7 carbon atoms or alkynyl groups having 2 to 7 atoms, wherein said alkyl, alkenyl and alkynyl groups may be substituted by halo, imino or amino.

4,595,683

3- AND 5-[BICYCLIC ETHER OR BICYCLIC ALKYLENE THIOETHER]ALKYLENE AMINO THIATRIAZINES, AND THEIR PHARMACEUTICAL USES

Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 604,988, Apr. 27, 1984. This application Oct. 23, 1984, Ser. No. 664,062

Int. Cl.[4] C07D *285/00, 417/12;* **A61K** *31/54*

U.S. Cl. 514—222 **21 Claims**

1. A method for the treatment of gastrointestinal hypersecretory or ulcerogenic disorders of a human or other mammal comprising administering thereto an effective antisecretory or antiulcerogenic amount of a 1,2,4,6-thiatriazine-1,1-dioxide compound substituted in one of the 2-,4- or 6-positions by hydrogen, lower alkyl, heterocyclylalkyl, cyclolower alkyl, phenyl lower alkyl, or substituted phenyl lower alkyl, and substituted in the 3- and/or the 5-position by a N-(bicyclic ether or bicyclic alkylene thioether)alkylene amino substituent of the formula:

$$—NR_3—(CH_2)_m—Z—(CH_2)_n—B;$$

wherein:

R_3 is H or lower alkyl;

m and n are 0, 1, 2, 3 or 4, provided $m+n \neq 0$;

Z is oxygen or sulfur;

B is a naphthyl, indanyl, quinolinyl, isoquinolinyl, tetrahydronaphthyl, benzocyclobutenyl, tetrahydroquinolinyl or tetrahydroisoquinolinyl group which may be substituted by amino, amino lower alkyl, lower alkylamino, dilower alkylamino, lower alkylamino lower alkyl, dilower alkylamino lower alkyl or azaheterocyclyl;

and, wherein:

azaheterocyclyl means piperidinyl, pyrrolidinyl, morpholinyl, azepinyl, pyrrolyl, imidazolyl, pyrazolyl, and thiamorpholinyl;

heterocyclylalkyl means lower alkyl substituted by azaheterocyclyl;

substituted phenyl means phenyl substituted by lower alkyl, halo, carboxyl, amino, lower alkylamino, amido, hydroxyl, nitro, cyano or sulfonyl;

or a pharmaceutically acceptable salt thereof.

4,595,684

METHOD OF SUPPRESSING BENZODIAZEPINE INDUCED SEDATION WITH 2-(p-METHOXYPHENYL-PYRAZOLO[4,3-C]QUINOLIN-3(5H)-ONE OR A SALT THEREOF

Debra A. Bennett, Middlesex, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,868

Int. Cl.[4] A61K *31/55*

U.S. Cl. 514—221 **6 Claims**

1. A method of suppressing benzodiazepine induced sedation of the type normally associated in the treatment of anxiety in a mammal receiving anxiolytically effective amount of a benzodiazepine anxiolytic agent, comprising the administration to said mammal of an effective sedation antagonistic amount of 2-(p-methoxyphenyl-)pyrazolo[4,3-c]quinolin-3(5H)-one or a pharmaceutically acceptable salt thereof.

4,595,685

BENZOTHIAZINE DERIVATIVES

Rainer Henning, Hattersheim am Main; Ulrich Lerch, Hofheim am Taunus, and Joachim Kaiser, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

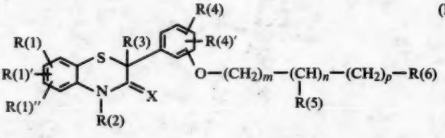
Filed Dec. 21, 1984, Ser. No. 684,711

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1983, 3347173

Int. Cl.[4] C07D *279/10, 417/12;* **A61K** *31/54*

U.S. Cl. 514—225 **12 Claims**

1. A benzothiazine derivative of the formula I



(I)

in which

R(1), R(1)′ and R(1)″ are identical or different and are independent of one another, and are hydrogen, (C_1–C_4)-alkyl, (C_1–C_3)-alkoxy, halogen, nitro, hydroxyl, acetamido or amino,

R(2) is hydrogen, (C_1–C_{10})-alkyl, straight-chain or branched, (C_3–C_{10})-alkenyl, straight-chain or branched, phenyl or phenyl-(C_1–C_4)-alkyl, the phenyl ring in each case being unsubstituted or substituted by one, two or

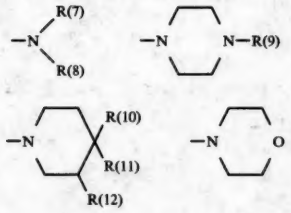
three substituents from the group consisting of (C_1–C_4)-alkyl, (C_1–C_3)-alkoxy, halogen, (C_1–C_2)-alkylenedioxy and nitro; (C_4–C_8)-cycloalkyl-(C_1–C_4)-alkyl, or (C_4–C_8)-cycloalkyl,

R(3) is hydrogen, (C_1–C_{10})-alkyl, straight-chain or branched, (C_3–C_{10})-alkenyl, straight-chain or branched, phenyl-(C_1–C_4)-alkyl, the phenyl group being unsubstituted or substituted by one, two or three substituents from the group consisting of (C_1–C_4)-alkyl, (C_1–C_3)-alkoxy, halogen, (C_1–C_2)-alkylenedioxy and nitro; (C_4–C_8)-cycloalkyl, or (C_4–C_8)-cycloalkyl-(C_1–C_4)-alkyl,

R(4) and R(4)′ are identical or different and, independently of one another, are hydrogen, (C_1–C_4)-alkyl, (C_1–C_3)-alkoxy, halogen, nitro, hydroxyl, acetamido or amino,

R(5) is hydrogen or (C_1–C_3)-alkyl,

R(6) is one of the following groups,



in which

R(7) and R(8) are identical or different and, independently of one another, are hydrogen, (C_1–C_{10})-alkyl, (C_4–C_8)-cycloalkyl, (C_4–C_8)-cycloalkyl-(C_1–C_4)-alkyl, phenyl-(C_1–C_6)-alkyl, the phenyl radical being unsubstituted or substituted by one, two or three radicals from the group consisting of (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, (C_1–C_2)-alkylenedioxy, halogen and hydroxyl; or pyridyl-(C_1–C_4)-alkyl,

R(9) is hydrogen, (C_1–C_{10})-alkyl, straight-chain or branched, phenyl, phenyl-(C_1–C_4)-alkanoyl or benzoyl, the phenyl radical in each case being unsubstituted or substituted by one, two or three radicals from the group consisting of (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, (C_1–C_2)-alkylenedioxy, halogen and hydroxyl; pyridyl, pyrimidyl, (C_1–C_5)-alkanoyl,

R(10) is hydrogen, (C_1–C_{10})-alkyl, phenyl, phenyl-(C_1–C_4)-alkyl, the phenyl radical in each case being unsubstituted or substituted by one, two or three radicals from the group consisting of (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, (C_1–C_2)-alkylenedioxy, halogen and hydroxyl:

R(11) is hydrogen, hydroxyl, (C_1–C_4)-alkoxy or, together with R(12), is a bond, and

R(12) is hydrogen or, together with R(11), is a bond;

in which formula I in addition

m is 1, 2, 3 or 4,

n is 0 or 1,

p is 0, 1, 2, 3 or 4, and

X is oxygen or two hydrogen atoms,

and the salts of the compound of the formula I with physiologically tolerated acids.

4,595,686

NIFLUMIC ACID MORPHOLINOETHYL ESTER DINIFLUMATE, USE AS ANALGESIC AND ANTI-INFLAMMATORY AGENTS AND COMPOSITIONS

Nicole Bru-Magniez, Paris; Jean-Marie Teulon, La Celle St Cloud, and Romano Deghenghi, Le Pecq, all of France, assignors to Hexachimie, Rueil-Malmaison, France

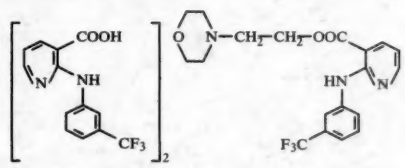
Filed Apr. 9, 1984, Ser. No. 597,808

Claims priority, application France, Apr. 21, 1983, 83 06579

Int. Cl.[4] A61K *31/535;* **C07D** *295/14*

U.S. Cl. 514—236 **4 Claims**

1. A compound consisting of niflumic acid morpholinoethyl ester diniflumate of formula:



(I)

2. An anti-inflammatory and analgesic pharmaceutical composition comprising an effective amount of the compound of claim 1 and a pharmaceutical carrier.

4,595,687

SPARSOMYCIN DERIVATIVES

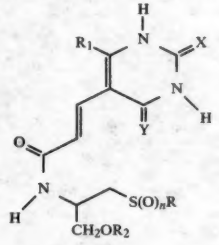
Douglas W. Beight, Cincinnati, and Gary A. Flynn, Madeira, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jul. 18, 1984, Ser. No. 632,133

Int. Cl.[4] A61K *31/505;* **C07D** *239/10*

U.S. Cl. 514—274 **8 Claims**

1. A method of inhibiting the growth of protozoa in animals in need thereof which comprises administering an antiprotozoal amount of a compound of the formula



wherein X and Y are each independently an oxo or an imino group; n is 0 or the integer 1 or 2; R_1 is a hydrogen or a 1 to 4 carbon alkyl group; R_2 is a hydrogen, a 1 to 4 carbon alkyl, a 2 to 5 carbon acyl or a benzoyl group; and R is a 1 to 6 carbon alkyl, 3 to 8 carbon alkenyl, pyridyl, furanyl or furfuryl group; or R is a phenyl or benzyl group each optionally substituted by a methylenedioxy group or one or two halogen, 1 to 4 carbon alkyl, 1 to 4 carbon alkoxy, 1 to 4 carbon alkylthio, hydroxy, nitro or cyano groups, or a pharmaceutically acceptable acid addition salt thereof.

4,595,688

HEXAHYDROPYRROLO[2,1-a]ISOQUINOLINE DERIVATIVES AND ANTIDEPRESSANT USE THEREOF

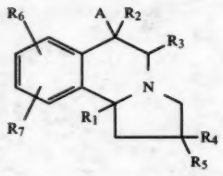
Bruce E. Maryanoff, New Hope, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 507,250, Jun. 23, 1983, abandoned. This application May 18, 1984, Ser. No. 611,646

Int. Cl.[4] A61K *31/47*; C07D *221/18*, *221/22*, *451/00*

U.S. Cl. 514—285 12 Claims

1. A compound of the following formula I including diastereomers and the nontoxic, pharmaceutically-acceptable acid addition salts thereof,



I

wherein

said compound has 6α,10bβ stereochemistry with respect to the A and R_1 moieties, respectively;

R_1 is hydrogen or lower alkyl having one to four carbons;

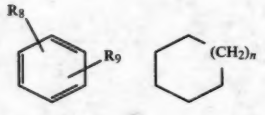
R_2 is hydrogen, lower alkyl having one to four carbons, fluoro, hydroxy, or lower alkoxy having one to four carbons;

R_3 is hydrogen, methyl, or phenyl;

R_4 and R_5 are the same and both are hydrogen, or are different and each is selected from the group of hydrogen or lower alkyl having one to four carbons;

R_6 and R_7 are the same or different and each is selected from the group hydrogen, lower alkyl having one to four carbons, lower alkoxy having one to four carbons, hydroxy, or halogen, or else are taken together as methylenedioxy; and

A is selected from the group of units of the following formulas (1) or (3):



1 3

wherein for the benzene unit of formula (1), R_8 and R_9 are selected from the group hydrogen, lower alkyl having one to six carbons, perfluoro(lower)alkyl having one to four carbons, hydroxy, lower alkoxy having one to four carbons, carb(lower)alkoxy having one to five carbons, lower alkanoylamino (one to five carbons), benzoylamino, cyano, carboxamido, lower alkanoyl of one to five carbons, lower alkylthio having one to four carbons, lower alkylsulfonyl having one to four carbons, nitro, amino, loweralkyl or di(lower)alkyl-amino having one to four carbons in each alkyl, or halogen; and wherein for the cycloalkyl unit of formula (3), n=0 to 2, which units of formulas (1) and (3) may be attached at any carbon atom vertex.

4,595,689

4-(8-BROMODIBENZ[B,F]OXEPIN-10-YL)-1,2,3,6-TETRAHYDRO-1-METHYLPYRIDINE AND 4-(2-BROMODIBENZO[A,D]CYCLOPHETATRIENE-11-YL)-1,2,3,6-TETRAHYDRO-1-METHYLPYRIDINE FOR DERMAL INFLAMMATION

Alfred Boris, Parsipanny; Robert W. Guthrie, Saddle Brook, and Richard W. Kierstead, North Caldwell, all of N.J., assignors to Hoffmann-LaRoche Inc., Nutley, N.J.

Filed Feb. 9, 1984, Ser. No. 578,726

Int. Cl.[4] C07D *407/04*

U.S. Cl. 514—337 4 Claims

1. A method for treating dermal inflammation which comprises topically administering to the affected area an effective amount of a compound selected from the group consisting of 4-(8-bromodibenz[b,f]oxepin-10-yl)-1,2,3,6-tetrahydro-1-methylpyridine, 4-(2-bromodibenzo[a,d]cycloheptatriene-11-yl)-1,2,3,6-tetrahydro-1-methylpyridine or a pharmaceutically acceptable addition salt thereof.

4,595,690

ANTIHYPERTENSIVE DIHYDROPYRIDINE DERIVATIVES

Robin Clark, Palo Alto, and Moysey M. Povzhitkov, Mountain View, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

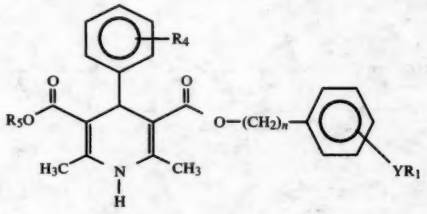
Filed Feb. 11, 1985, Ser. No. 700,439

Int. Cl.[4] C07D *211/90*; A61K *31/455*

U.S. Cl. 514—356 23 Claims

1. A compound of the formula

(1)



or a pharmaceutically acceptable acid addition salt thereof, wherein:

n is an integer from 0 to 8;

Y is —O, —NH, —NR_2, —S, —S(O), —$S(O)_2$, or a bond;

R_1 and R_2 are each independently A_1, A_2, A_3 or A_4 where

A_1 is —$(CH_2)_m(CHOH)_pCH_2OH$;

A_2 is —$(CH_2)_qCH_{(3-r)}[(CH_2)_sOH]_r$;

A_3 is —$(CH_2)_qCH_{(3-r)}[(CH_2)_pCOOR_3]_r$; and

A_4 is —$(CH_2)_mCOOR_3$; where

m is an integer from 1 to 8;

p is an integer from 0 to 4;

q is an integer from 0 to 8;

r is 2 or 3;

s is an integer from 1 to 4; and

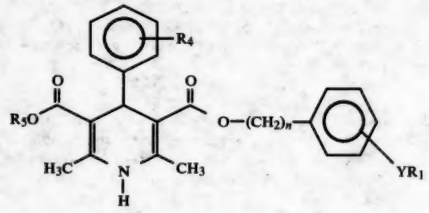
R_3 is H or alkyl of 1 to 18 carbon atoms;

R_4 is —NO_2, —CF_3, or halo; and

R_5 is lower alkyl or —$CH_2CH_2OCH_3$.

15. A method for treating hypertension, congestive heart failure, angina, migraine, and vasospastic disorders which comprises administering a therapeutically effective amount of a compound of formula

(I)



or a pharmaceutically acceptable acid addition salt thereof, wherein:

n is an integer from 0 to 8;

Y is —O, —NH, —NR_2, —S, —S(O), —$S(O)_2$, or a bond;

R_1 and R_2 are each independently A_1, A_2, A_3 or A_4 where:

A_1 is $—(CH_2)_m(CHOH)_pCH_2OH$;

A_2 is $—(CH_2)_qCH_{(3-r)}[(CH_2)_sOH]_r$;

A_3 is $—(CH_2)_qCH_{(3-r)}[(CH_2)_pCOOR_3]_r$; and

A_4 is $—(CH_2)_mCOOR_3$; where

m is an integer from 1 to 8;

p is an integer from 0 to 4;

q is an integer from 0 to 8;

r is 2 or 3;

s is an integer from 1 to 4; and

R_3 is H or alkyl of 1 to 18 carbon atoms;

R_4 is $—NO_2$, $—CF_3$, or halo; and

R_5 is lower alkyl or $—CH_2CH_2OCH_3$.

4,595,691

SYNERGISTIC BIOCIDE OF 2-(THIOCYANOMETHYLTHIO) BENZOTHIAZOLE WITH A MIXTURE OF 5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE AND 2-METHYL-4-ISOTHIAZOLIN-3-ONE

Thomas M. LaMarre, Aurora; Cynthia H. Martin, Joliet, and Madelynn T. Wilharm, Woodridge, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 22, 1985, Ser. No. 757,695

Int. Cl.[4] A01N *43/78*; C02F *9/00*; D21H *5/22*

U.S. Cl. 514—367 **1 Claim**

1. A synergistic biocidal composition useful in treating industrial process waters to prevent and control the growth of Pseudomonas bacteria, which composition comprises:

A. from 10–90% by weight of 75% 5-chloro-2-methyl-4-isothiazolin-3-one and 25% 2-methyl-4-isothiazolin-3-one; and

B. from 90–10% by weight of 2-(thiocyanomethylthio)-benzothiazole.

4,595,692

7-THIABICYCLOHEPTANE SUBSTITUTED ETHERS

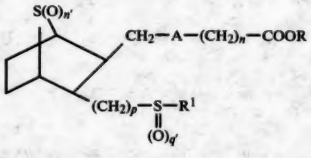
Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 17, 1985, Ser. No. 735,250

Int. Cl.[4] A61K *31/38*; C07D *333/64, 333/56*

U.S. Cl. 514—443 **20 Claims**

1. A compound of the structure



including all stereoisomers thereof, wherein A is —CH=CH— or —CH_2—CH_2—; n is 0 to 8; n' is 0 or 1; p is 1 to 4; wherein q is 0, 1 or 2; R is H, lower alkyl, alkali metal or tris(hydroxymethyl)aminomethane; and R^1 is lower alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, lower alkenyl or lower alkynyl.

4,595,693

METHOD OF USE OF 2,5-DIARYL TETRAHYDROFURANS AND ANALOGS THEREOF AS PAF-ANTAGONISTS

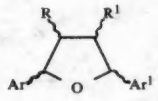
Tesfaye Biftu, Westfield; Thomas W. Doebber, Scotch Plains; San-Bao Hwang, Scotch Plains; Thomas R. Beattie, Scotch Plains; Tsung-Ying Shen, Westfield, all of N.J., and Robert Stevenson, Lexington, Mass., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 4, 1984, Ser. No. 617,294

Int. Cl.[4] A61K *31/34*

U.S. Cl. 514—461 **3 Claims**

1. A method for the treatment of a disease or a disorder mediated by PAF comprising administering to a mammalian species in need of the treatment a therapeutically effective amount of a compound of formula:



wherein R is:

(a) hydrogen;

(b) lower alkyl of 1–6 carbon atoms;

(c) halologeralkyl;

(d) halo;

(e) COOH;

(f) $CONR^2R^3$ wherein R^2 and R^3 independently represent C_{1-6} alkyl and hydrogen;

(g) $COOR^*$ wherein R^* is C_{1-6}alkyl;

(h) loweralkenyl;

(i) $—COR^2$;

(j) $—CH_2OR^2$;

(k) loweralkynyl;

(l) $—CH_2NR^2R^3$;

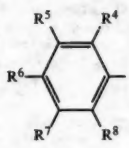
(m) $—CH_2SR^2$;

(n) =O; or

(o) $—OR^2$;

R^1 is lower alkyl; —COOH; or $—COOR^*$; Ar and Ar^1 are the same or different from each other and are

(a) phenyl of formula



where R^4–R^8 independently represent H, RO—, R^2S, R^2SO, R^2SO_2—, CF_3O—, CF_3S—, R^2R^3N—, —OCH-$_2CO_2R^2$, $—SO_2NR_2R^3$, $—CO_2R^2$, $—NR^2SO_2R^3$, COR^2, NO_2, or CN or R^4–R^5, R^5–R^6, R^6–R^7 and R^7–R^8 are joined together forming a bridge;

(b) pyrryl;

(c) furyl;

(d) pyridyl; or

(e) thiophene.

4,595,694

AZULENE DERIVATIVES, PROCESSES OF THEIR SYNTHESIS AND THEIR USES AS ANTI-ULCERATIVE AND ANTI-INFLAMMATORY AGENTS

Kahei Takase; Masafumi Yasunami, both of Sendai; Tsuyoshi Tomiyama, Sakaki; Akira Tomiyama, Togura, and Takashi Yanagisawa, Sakaki, all of Japan, assignors to Kotobuki Seiyaku Co. Ltd., Nagano, Japan

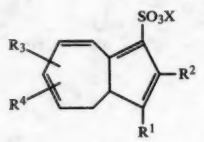
Filed Aug. 17, 1984, Ser. No. 642,043

Claims priority, application Japan, Aug. 24, 1983, 58-153187; Jan. 28, 1984, 59-014028

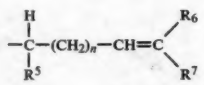
Int. Cl.[4] C07F *5/06*

U.S. Cl. 514—492 12 Claims

1. An azulene derivative of the formula:



wherein R^1 is a lower alkyl, benzyl or



group, in which R^5, R^6, R^7 each represent H or a lower alkyl group and n is an integer of 1 or 2;

R^2 and R^3 each represent H or a lower alkyl group;

R^4 is H or an alkoxy group and X is Na or $Al(OH)_2$ with the proviso that R^3 and R^4 may be at any two of positions 4, 5, 6 and 7.

9. A therapeutic composition comprising a pharmaceutically acceptable carrier and, as an active ingredient, a compound defined in claim 1 in an amount effective to treat peptic ulcer.

4,595,695

1'-ETHOXYCARBONYLOXYETHYL ESTER OF VALPROIC ACID, ITS PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

David Ladkani, Jerusalem; Haim Yellin, Ramat-Gan, and Ben Z. Weiner, Jerusalem, all of Israel, assignors to Teva Pharmaceutical Industries Ltd., Israel

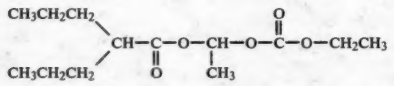
Filed Nov. 16, 1983, Ser. No. 552,336

Claims priority, application Israel, Jan. 5, 1983, 67623

Int. Cl.[4] A61K *31/265;* C07C *69/00*

U.S. Cl. 514—512 3 Claims

1. Valproic acid 1'-ethoxycarbonyloxyethyl ester of the formula:



(I)

2. Method of effecting anti-epileptic action, which comprises administering to a patient requiring the same an anti-epileptic effective amount of the compound of claim 1.

4,595,696

POLYENE COMPOUNDS USEFUL IN THE TREATMENT OF ALLERGIC RESPONSES

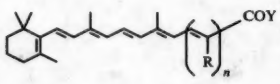
Bernard Loev, Scarsdale, and Wan-Kit Chan, Yorktown Heights, both of N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Sep. 13, 1985, Ser. No. 775,870

Int. Cl.[4] A61K *31/21, 31/24*

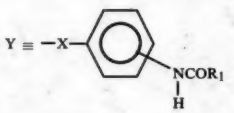
U.S. Cl. 514—513 2 Claims

1. A method for treating inflammatory conditions and allergic responses in a human host which comprises administering to said host a therapeutically effective amount of at least one compound of the formula



where

R=H or an alkyl group of from 1 to 5 carbon atoms



n=0–1

X=0 or S; and

R_1=an alkyl group of from 1 to 5 carbon atoms; and the pharmaceutically acceptable salts thereof.

4,595,697

TREATMENT OF SEIZURE DISORDERS AND PHARMACEUTICAL COMPOSITIONS USEFUL THEREIN

Nikolaus Seiler, and Shakir Sarhan, both of Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 594,079, Mar. 28, 1984, Pat. No. 4,540,582.

This application Feb. 27, 1985, Ser. No. 705,955

Int. Cl.[4] A61K *31/24*

U.S. Cl. 514—534 10 Claims

1. A method for controlling seizures in a patient in need thereof which comprises administering to said patient in combination:

(a) from 0.2 to 2.0 grams per day of gamma-vinyl GABA, or a pharmaceutically acceptable salt thereof; and

(b) from 2 to 12 grams per day of a C_1–C_8 alkyl ester of glycine, sarcosine, N,N-dimethylglycine or a pharmaceutically acceptable salt thereof.

4,595,698

PHYSIOLOGICALLY ACTIVE SUBSTANCE, ARPHAMENINE AND PRODUCTION THEREOF

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, Tokyo; Masa Hamada, Tokyo, and Masaaki Ishizuka, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

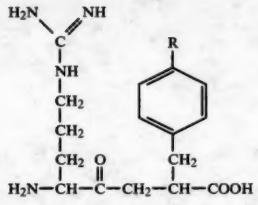
Filed Jun. 2, 1983, Ser. No. 500,396

Claims priority, application Japan, Jun. 7, 1982, 57-96276

Int. Cl.[4] A61K *31/195;* C07C *119/00*

U.S. Cl. 514—565 7 Claims

1. The compound, arphamenine which is selected from arphamenine A and arphamenine B according to the general formula



wherein R denotes a hydrogen atom for arphamenine A; and R denotes a hydroxyl group for arphamenine B, and a pharmaceutically acceptable salt of arphamenine.

4. A pharmaceutical composition useful as an immunopatentiator comprising a safe and effective amount of at least one of arphamenine A, arphamenine B and a pharmaceutically acceptable salt thereof, in admixture with a pharmaceutically acceptable carrier.

7. A method for inhibiting the growth of Sarcoma 180 and Ehrlich ascites tumor in mice, which comprises administering a safe and anti-tumor effective amount of at least one of arphamenine A, arphamenine B and a pharmaceutically acceptable salt thereof as defined in claim 1, to said animal.

4,595,699

IMMUNE SYSTEM REGULATION USING NOVEL PHENYLALKANOIC ACID DERIVATIVE

Atsusuke Terada; Shunji Naruto, and Yoshio Iizuka, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

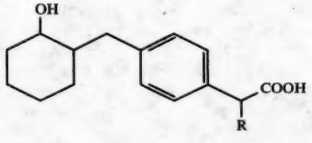
Filed Apr. 16, 1984, Ser. No. 600,372

Claims priority, application Japan, Apr. 21, 1983, 58-70794

Int. Cl.⁴ C07C *69/76, 63/33*

U.S. Cl. 514—570 **6 Claims**

1. The method of regulating the immune system of a mammal, which comprises administering to said mammal an immuno-regulatory agent, wherein said agent is selected from the group consisting of compounds of the formula (I):



(I)

(wherein R represents hydrogen or a C_1–C_3 alkyl group) and pharmaceutically acceptable salts and esters thereof.

4,595,700

THIOL BASED COLLAGENASE INHIBITORS

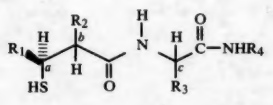
David K. Donald, High Wycombe; Michael M. Hann, Watlington; John Saunders, Ickford, and Harry J. Wadsworth, High Wycombe, all of Great Britain, assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 685,180, Dec. 21, 1984, abandoned. This application Feb. 21, 1985, Ser. No. 703,973

Int. Cl.⁴ C07C *149/23*; A61K *31/16, 31/165*

U.S. Cl. 514—616 **11 Claims**

1. A compound of the formula



wherein

R_1 represents lower alkyl, phenyl or phenyl lower alkyl;

R_2 and R_4 represent lower alkyl; and

R_3 represents lower alkyl, benzyloxyalkyl, alkoxybenzyl or benzyloxybenzyl wherein the oxyalkyl or alkoxy moiety contain 1 to 6 carbon atoms; and a, b, and c, represent chiral centers with optional R or S stereochemistry.

4,595,701

PROCESS FOR PRODUCING ALIPHATIC ALCOHOLS

Shuzo Nakamura, Takatsuki; Takashi Deguchi, Kusatsu; Mitsuhisa Tamura, Ibaraki; Masaru Ishino, Takatsuki; Keisuke Wada, Yokohama; Eiichi Watanabe, Shiroyama; Yoshinori Hara; Kenji Murayama, both of Machida, and Hiroo Tanaka, Yokohama, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,893

Claims priority, application Japan, Dec. 26, 1983, 58-244171; Jan. 10, 1984, 59-1408; Jan. 17, 1984, 59-4750; Nov. 2, 1984, 59-230235

Int. Cl.⁴ L07C *27/06*

U.S. Cl. 518—701 **15 Claims**

1. A process for producing aliphatic alcohols by reacting carbon monoxide and hydrogen in a liquid phase in the presence of a catalyst system, comprising:

rhodium, and a trialkylphosphine of the formula: $PR_2R_2R_3$, wherein each of R_1, R_2 and R_3 is a primary alkyl group, a secondary alkyl group, a tertiary alkyl group or a cycloalkyl group, as the catalyst components.

4,595,702

CONVERSION OF SYNTHESIS GAS TO LIQUID HYDROCARBONS

Yung F. Chu; James A. Brennan, and Arthur W. Chester, all of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 572,479, Jan. 20, 1984, abandoned. This application Apr. 3, 1985, Ser. No. 719,592

Int. Cl.⁴ C07C *1/04*

U.S. Cl. 518—713 **24 Claims**

1. In a process for converting synthesis gas to liquid hydrocarbon fuels, said process comprising contacting said synthesis gas with a catalyst comprising an intimate mixture of a potassium promoted, precipitated, inorganic iron catalyst containing copper and a crystalline zeolite selected from the group consisting of ZSM-5 type, ZSM-45 and Beta under a combination of conditions effective for converting said synthesis gas to at least 70 wt % of liquid products in the C_5 to C_{24} boiling range with not more than 12 wt % of $C_1+C_2^=$ by-product, and recovering said liquid products; the improvements comprising said inorganic iron catalyst containing less than 200 ppm nitrogen and said contacting being conducted under a temperature of from about 430° F. to about 510° F.

4,595,703

PREPARATION OF HYDROCARBONS FROM SYNTHESIS GAS

Virgil L. Payne, and Charles H. Mauldin, both of Baton Rouge,, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1984, Ser. No. 626,023

Int. Cl.⁴ C07C *1/04*

U.S. Cl. 518—715 **24 Claims**

1. A process useful for the conversion of synthesis gas to hydrocarbons which comprises contacting at reaction conditions a feed comprised of an admixture of carbon monoxide and hydrogen, in H_2:CO molar ratio equal to or greater than about 0.5:1 at total pressure equal to or greater than about 80 psig, over a catalyst which comprises cobalt, or cobalt and thoria in catalytically active amount composited with titania or titania-containing support, wherein the titania support is one having a rutile:anatase ratio of at least about 2:3.

4,595,704

PREPARATION OF ION-EXCHANGE CATALYSTS

Michael J. Fazio, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 13, 1984, Ser. No. 639,980
Int. Cl.[4] C08F 5/20; C08C 19/00
U.S. Cl. 521—31 20 Claims

1. A process comprising contacting a strong-acid cation-exchange resin in acid form with an N-(2-mercaptoalkyl)amide in the presence of water under reaction conditions sufficient to produce an insoluble strong-acid cation-exchange resin in acid form modified by the partial neutralization of its cation-exchange capacity with an aminoalkanethiol.

9. A process comprising

(a) contacting a strong-acid cation-exchange resin in acid form with an N-(2-mercaptoalkyl)amide in the presence of water under reaction conditions sufficient to produce an insoluble strong-acid cation-exchange resin in acid form modified by the neutralization of from about 5 to about 80 mole percent of its cation-exchange capacity with an aminoalkanethiol; and

(b) contacting the partially neutralized resin of (a) with an aldehyde or ketone under reaction conditions sufficient to convert the aminoalkanethiol moieties to thiazolidine moieties.

4,595,705

PROCESS FOR THE PREPARATION OF OPTIONALLY CELLULAR POLYURETHANE POLYUREA MOLDED PARTS

Frank Werner, Neustadt; Matthias Marx, Bad Durkheim; Peter Horn, Heidelberg, and Hans U. Schmidt, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 700,758
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 340567
Int. Cl.[4] C08G 18/14, 18/30
U.S. Cl. 521—51 9 Claims

1. In a process for the one-shot preparation of a polyurethane polyurea polymer product which is either cellular, microcellular, or non-cellular or which comprises a cellular core and a non-cellular skin by the reaction of polyisocyanates, a polyol component, and aromatic diamines, in the presence of suitable catalysts, and optionally, blowing agents, chain extenders, additives and auxiliaries, the improvement comprising employing as the polyol component, a mixture comprising:

(i) from 95 to 60 percent by weight of a conventional polyol selected from the group consisting of polyether polyols, hydroxyl-functional polyester polyols, polythioether polyols, hydroxyl-functional polyacetal polyols, hydroxyl-functional polycarbonate polyols, polyether polyamine polyols, polyesteramides and their mixtures, wherein said conventional polyol has a functionality of from 2 to 6 and a molecular weight of from 1000 to 8000, and

(ii) from 5 to 40 percent by weight of an aromatic polyol selected from the group consisting of aromatic polyester polyols, aromatic-aliphatic polyester polyols, and mixtures thereof, wherein said aromatic polyol has a functionality of from 2 to 3 and a molecular weight of from 254 to 700, wherein the percents by weight of polyols (i) and (ii) are relative to the weight of the total polyol components, (i) and (ii).

4,595,706

ANTI-STATIC PACKING MATERIAL

Dennis J. Milligan, Lake Jackson, and Phil Rolland, Dallas, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 9, 1985, Ser. No. 773,901
Int. Cl.[4] C08J 9/36, 9/38
U.S. Cl. 521—53 12 Claims

1. A method of imparting surface conductivity to polymeric packing material, the method comprising a step of at least partially fluorinating to an effective depth of up to about 50 microns of the surface a foamed packing material of polyethylene, polystyrene, polyolefin, polyurethane and co-polymers thereof and a subsequent step of dehydrofluorinating by contact with a strong base.

4,595,707

MEMBRANES COMPRISING MICROPOROUS STRUCTURE

Kathleen M. McCreedy, Midland, Mich.; Edward J. Kramer, Ithaca, N.Y., and Lu H. Tung, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 11, 1985, Ser. No. 700,791
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—62 29 Claims

1. A process for providing a polymer composition suitable for use as a membrane composition, said polymer composition comprising at least one region having a microporous structure, said process comprising

(a) providing a glassy polymer composition optionally having a functionally effective amount of crosslinking, and

(b) providing said membrane composition by crazing the glassy polymer composition in an amount sufficient to provide to the glassy polymer composition at least one microporous domain, wherein

(c) said glassy polymer composition is crazed in the presence of monomers which graft polymerize with said glassy polymer composition during said crazing.

4,595,708

REVERSE OSMOSIS MEMBRANE, CASTING SOLUTION, AND PROCESSES FOR MAKING SAME

Sherman A. Sundet, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 6, 1984, Ser. No. 597,383
Int. Cl.[4] C08J 9/28, 9/26; C08K 3/16; C08L 77/10
U.S. Cl. 521—63 20 Claims

1. In a membrane casting solution comprising about 10 to about 35%, by weight of a film forming polyaramide containing sulfonate substituents on the aromatic rings present in an amount of from about 7 to 11.5 milliequivalents of SO_3^- per gram of polymer, solvent and at least one metal salt, the improvement wherein the solvent is at least about 60% by wt. N,N-dimethylacetamide, the metal salt comprises $MgCl_2$ which has been formed in situ by reaction of HCl with a basic magnesium compound, and the amount of magnesium ion, expressed as $MgCl_2$, is about 10 to about 60% by wt., based on said polyaramide, and is about 3% to about 9% by wt., based on the total weight of the casting solution, and the water:magnesium ion molar ratio is in the range of 2.2:1 to 1:1.

4,595,709

PROCESS FOR THE PRODUCTION OF ISOCYANATE POLYADDITION PRODUCTS

Artur Reischl, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,451
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015576
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—79 16 Claims

1. A process for the production of polyaddition products containing urethane groups in which an isocyanate-group-containing distillation residue obtained in the commercial production of tolylene diisocyanate is reacted continuously with a compound having an average molecular weight of less than 600 and containing at least two alcoholic hydroxyl groups in an NCO/OH equivalent ratio less than 1.5:1 at a temperature in the range of 50° to 220° C. in a reaction extruder.

4,595,710
FOAMED PLASTICS MATERIALS

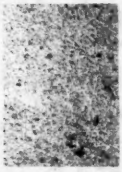
Aldino Albertelli; Lothar M. Hohmann, both of London, and Anthony N. Curtis, Dorchester, Oxon, all of England, assignors to Company "A" (Foam) Limited, London, Scotland

Continuation of Ser. No. 271,364, Jun. 8, 1981. This application Jan. 31, 1985, Ser. No. 697,009

Claims priority, application United Kingdom, Sep. 14, 1978, 368201/78

Int. Cl.[4] C08J 9/12

U.S. Cl. 521—100 **25 Claims**



1. A method for the production of a foamed phenolic resin material, the method comprising

(i) in the absence of added blowing agent effecting a curing reaction between

(a) a liquid phenolic resole containing not more than 35% by weight of water and having a reactivity number of at least 1, where reactivity number is defined as 10/x where x is the time in minutes required for a mixture of 5 ml of the resole and 10% by weight of the resole of a 66–67% aqueous solution of p-toluene sulfonic acid to become hard to the touch after the mixture has been prepared in a test tube and the test tube containing the mixture has been immersed in a water bath which is at 60° C., and

(b) an amount of a strong acid suitable as a hardener for said resole which is equivalent to 2 to 20 parts, per 100 parts of the phenol/aldehyde condensation product in the resole, by weight, of p-toluene sulfonic acid, in the presence of

(c) a finely divided inert and insoluble particulate solid which has a particle size of 0.5 to 800 microns and is present in an amount of from 20 to 250% by weight of the liquid resole and is substantially uniformly dispersed through the mixture of resole and hardener;

the temperature of the mixture containing resole and hardener due to any applied heat not exceeding 85° C. and said temperature and the concentration of the acid hardener being such that at least one compound present in the resole or generated as a by-product of the curing reaction is volatilized within the mixture before the mixture sets, and

(ii) recovering a foamed phenolic resin product having a cellular texture of substantially uniform cell size and being substantially free of blow holes.

4,595,711
AROMATIC POLYESTER POLYOLS FLUOROCARBON COMPATIBILIZED WITH ETHOXYLATE PROPOXYLATE COMPOUNDS FOR URETHANE AND ISOCYANURATE FOAMS

Robert J. Wood, Round Lake Park, Ill., assignor to Stepan Company, Northfield, Ill.

Continuation-in-part of Ser. No. 622,670, Jun. 20, 1984, Pat. No. 4,529,744, which is a continuation-in-part of Ser. No. 436,551, Oct. 25, 1982, abandoned. This application Apr. 22, 1985, Ser. No. 725,394

Int. Cl.[4] C08G 18/14

U.S. Cl. 521—158 **17 Claims**

1. A polyol blend composition useful in the preparation of polyisocyanurate and/or polyurethane foams comprising on a 100 weight percent total weight basis:

(A) from about 0.5 to 20 weight percent of at least one nonionic block ethoxylated propoxylate compound of the formula:

$$RO(CH_2CHO)_p-(CH_2CHO)_n-(CH_2CH_2O)_m-H \quad (I)$$

(CH₃ on the first CHO; X on the second CHO)

wherein:

R is a radical selected from the group consisting of alkyl phenyl radicals wherein the alkyl group in each such radical contains from about five to eighteen carbon atoms; alkyl radicals each containing from two through eighteen carbon atoms; and radicals of the formula:

$(CH_2CH_2O)_m-H$,

X is selected from the group consisting of methyl and hydrogen,

p is a positive whole number ranging from about 10 to 5,

n is a positive whole number ranging from about 10 to 70,

m is an independently selected positive whole number ranging from about 15 to 250, and the sum of m plus n plus p is a number in the range from about 35 to 200 in any given molecule;

(B) from about 20 to 93 weight percent of at least one aromatic polyester polyol characterized by having a molecular weight in the range from about 200 to 1200, an hydroxyl value ranging from about 45 to 2000, a functionality ranging from 2 to 8; and a molecular structure selected from the group consisting of monophenyl polyesters, diphenyl polyesters, and benzyl polyesters; and reaction products of glycols with polyethylene teraphthalate residue products

(C) from and including 0 to about 40 weight percent of at least one second hydroxyl group containing polyol characterized by having a molecular weight in the range from about 60 to 1200, an hydroxyl value in the range from about 45 to 1600, and a funtionality in the range from about 2 to 8, and which is preferably selected from the class consisting of:

(a) polyalkoxylated Mannich bases prepared by reacting phenols with diethanol amine and formaldehyde,

(b) polyalkoxylated glycerines,

(c) polyalkoxylated sucrose,

(d) polyalkoxylated aromatic and aliphatic amine based polyols,

(e) polyalkoxylated sucrose-amine mixtures,

(f) hydroxyalkylated aliphatic monoamines and/or diamines,

(g) aliphatic polyols,

(h) polybutadiene resins having primary hydroxyl groups, and

(i) phosphorous containing polyols

said polyol blend composition having an hydroxyl number in the range from about 150 to 600.

4,595,712
STABLE PREPOLYMERS OF POLYISOCYANATE WITH HYDROXYL FUNCTIONS, A PROCESS FOR THEIR MANUFACTURE AND THEIR APPLICATION TO THE MANUFACTURE OF POLYURETHANES

Francois-Bernard Laumain, Levallois-Perret, France, assignor to Societe Chimique des Charbonnages, S.A., France

Filed Jan. 22, 1985, Ser. No. 693,109

Int. Cl.[4] C08G 18/14, 18/32

U.S. Cl. 521—167 **12 Claims**

1. A stable polyisocyanate prepolymer containing hydroxy groups comprising a product of the polyaddition of at least one organic polyisocyanate with at least one condensation product (A) of an alkylene oxide with an amine, in the presence of at least one polyol (B) containing free hydroxy functions, the polyol (B) containing no primary hydroxy functions and having a molecular weight of at least 1,300, the condensation product (A) and the polyol (B) being present in an amount effective to yield a stable polyisocyanate prepolymer containing hydroxy groups.

4,595,713

MEDICAL PUTTY FOR TISSUE AUGMENTATION

Kenneth St. John, Tracy, Calif., assignor to Hexcel Corporation, San Francisco, Calif.

Filed Jan. 22, 1985, Ser. No. 693,162
Int. Cl.[4] A61K *31/23, 31/74, 35/32*
U.S. Cl. 523—105 15 Claims

1. A medical implant for the promotion of the regeneration of connective tissue, comprising:

a shaped mass comprising a copolymer of epsilon caprolactone and lactide, said epsilon caprolactone being present in a major amount, further comprising an amount of osteogenic material effective to augment regeneration of soft or hard connective tissue incorporated in said mass,

said shaped mass being moldable under mild pressure when heated to a temperature of about 115°–160° F., but resistant to permanent deformation under applied pressure at temperatures below about 110° F.

4,595,714

ABLATIVE COATING COMPOSITION AND PRODUCT

Lawrence E. McAllister, Dayton; Herbert Dietrich, Kennybunk, and John E. Hill, Jr., Biddeford, all of Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Filed Mar. 13, 1981, Ser. No. 243,608
Int. Cl.[4] C08K *3/18*
U.S. Cl. 523—179 22 Claims

1. A coating composition suitable for application to a substrate for curing thereon to form an ablative coating, said composition consisting essentially of

(a) a reactive resin mixture of an epoxy resin and a polysulfide resin in which said epoxy resin makes up at least 25% by weight of the total resin content, said reactive mixture being self-curing to provide a tough, adherent coating which forms a char when expsoed to an ablative/erosion environment;

(b) an amine curing agent for said reactive mixture;

(c) a mixture of finel divided borate and aluminum trihydrate present in combination in an amount equivalent to between 20% and about 25% by weight of said total resin content; and

(d) short refractory fibers which retain their fibrous structure during formation of said char in an amount sufficient to strengthen and toughen said char as the latter is formed.

4,595,715

ORIENTED POLYESTER FILM CONTAINING CALCIUM CARBONATE AND KAOLINITE

Katsuaki Kuze; Yujiro Matsuyama, both of Otsu; Kozo Maeda, Takatsuki; Takeshi Ota, Tsuruga; Masahiro Kobayashi, Kyoto; Tsuyoshi Hongo, Otsu, and Osamu Makimura, Ogaki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha T/A Toyobo Co., Ltd., Osaka and Nippon Magphane Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sep. 7, 1984, Ser. No. 648,096
Claims priority, application Japan, Sep. 8, 1983, 58-166158
Int. Cl.[4] G11B *5/62;* C08K *3/26*
U.S. Cl. 523—181 9 Claims

1. An oriented polyester film comprising ethylene terephthalate as the major repeating unit, which comprises particles of kaolinite and calcium carbonate uniformly dispersed therein, said kaolinite and said calcium carbonate having each an average particle size of 0.05 to 0.8 micron and being contained in such amounts as satisfying the following relationships:

$$70 \leqq D \times A \leqq 1000 \quad \text{(I)}$$

$$1000 \leqq A + B \leqq 10000 \quad \text{(II)}$$

$$0.1 \leqq B/A \leqq 25 \quad \text{(III)}$$

wherein D is an average particle size (micron) of calcium carbonate, A is a content (ppm) of calcium carbonate and B is a content (ppm) of kaolinite; said film including not more than 3 coarse particles per 4.8 mm^2.

4,595,716

BASE FOR A GRAFT POLYMER, NOVEL GRAFT POLYMER COMPOSITIONS, SOLVENT AND WATER-REDUCIBLE COATINGS INCORPORATING THE NOVEL GRAFT POLYMERS, AND PROCESSES FOR MAKING THEM

James T. K. Woo, Medina, Ohio; Vincent W. Ting, Boulder, Colo., and Richard M. Marcinko, N. Royalton, Ohio, assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 438,375, Nov. 1, 1982, Pat. No. 4,482,671, which is a division of Ser. No. 132,507, Mar. 21, 1980, Pat. No. 4,399,241. This application Aug. 30, 1984, Ser. No. 645,962
Int. Cl.[4] C08L *63/00*
U.S. Cl. 523—403 16 Claims

1. A resinous reaction product comprising a mixture of resinous solids, said solids being made up of components comprising:

(i) addition polymerized monomer;

(ii) an aromatic 1,2-epoxy resin having an epoxy equivalent weight of at least 500;

(iii) an extender polymer, wherein each of said epoxy resin and said extender polymer have aliphatic backbone carbon atoms that have one or more hydrogens bonded thereto, and

(iv) graft polymers of each of the epoxy resin and the extender polymer in which addition polymer side chains are grafted by carbon-to-carbon bonds to at least some of said aliphatic backbone carbon atoms of the resin and of the polymer that had one or two hydrogens bonded thereto in the ungrafted state, the extender polymer selected from polystyrene, low molecular weight polyethylene, styrene-acrylate copolymer, ethylene-vinyl acetate copolymer, a hydroxyl terminated polyester or polyurethane, styrene-acrylonitrile copolymer, a hydrogen resin, a second epoxy resin, or a mixture thereof.

4,595,717

AQUEOUS ELECTRODIP LACQUER COATING COMPOUND CAPABLE OF BEING DEPOSITED AT THE CATHODE, AND ITS USE

Hans-Peter Patzschke; Armin Göbel, and Klausjörg Klein, all of Wuppertal, Fed. Rep. of Germany, assignors to Herberts Gesellschaft mit beschraenkter Haftung, Wuppertal, Fed. Rep. of Germany

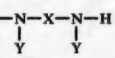
Filed Oct. 1, 1984, Ser. No. 656,356
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336749
Int. Cl.[4] C08G *59/14;* C09D *3/49, 5/40;* C25D *13/04*
U.S. Cl. 523—414 8 Claims

1. Aqueous electrodip lacquer coating compound capable of being deposited at the cathode, containing pigments, fillers, corrosion inhibitors, lacquer auxiliaries, and, in a quantity of up to 20% by weight, based on the total weight of coating compound, organic solvents, and the following synthetic resin binder:

(A) 55 to 95% by weight, based on the total quantity of synthetic resin binder, of a synthetic resin binder containing hydroxyl groups and tertiary amino groups and having an average molar weight ($\overline{Mn}$) of 500 to 20,000, a pK_b value of 3 to 7 and a hydroxyl number of 50 to 400 and an amine number of 30 to 150, which binder can be rendered water soluble by protonation with acid, and

(B) 5 to 45% by weight of a cross-linking agent containing ester groups capable of transesterification or transamidation and having an average molar weight ($\overline{Mn}$) of 350 to 5,000, an ester number of terminal reactive ester groups of 30 to 500, the ester groups being substantially stable in a neutral aqueous medium but capable of reacting with hydroxyl groups of synthetic resin binder (A) in an alka-

line medium at temperatures above 140° C., wherein component (A) contains, in a quantity of at least 8% by weight, calculated as compounds of formula I and based on the total weight of component (A), at least one molecule-enlarging diamine corresponding to the formula:



(I)

wherein the symbol Y stands for H or C_mH_{2m+1}(m=1 to 8) or an organic group used for defunctionalisation, formed by reaction of the primary amino group with monoepoxides, and the symbol X represents a molecular grouping containing at least one amide or urea group, the grouping X being attached to the nitrogen atoms of formula (I) through alkylene groups having 1 to 16 carbon atoms.

4,595,718

FLUOROCARBON POLYMER COMPOSITIONS

Christopher M. Allen, Mountsorrel, and Ian R. Hinchliff, Leicester, both of England, assignors to USM Corporation, Flemington, N.J.

Division of Ser. No. 403,626, filed as PCT GB81/00248, Nov. 19, 1981 published as WO82/01713, May 27, 1982, Pat No. 4,548,989.

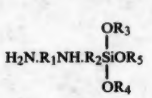
This application Jul. 19, 1985, Ser. No. 734,548

Claims priority, application United Kingdom, Nov. 21, 1980, 8037487

Int. Cl.[4] C08F *8/00*; B05D *5/00*

U.S. Cl. 523—434 **6 Claims**

1. A method of producing a mass of heat and aircraft fuel resistant elastomeric material in the form of a coating bonding layer or sealant mass adherent to one or more substrates of titanium or aluminium alloy characterised by the steps of forming a substantially solvent free primer coating on one or more substrates of titanium or aluminium alloy by application of a primer composition comprising organic material having isocyanate groups and hydrolysable silane groups available for reaction and organic solvent, and providing in contact with the primer coating a room temperature curable composition which comprises a fluorocarbon copolymer and a metallic oxide, characterised in that the composition is at least substanially free of thiol and comprises a compound having epoxy groups, and as crosslinking agent a diamino silane according to the general formula (i) namely



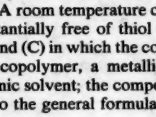
in which

R_1 is an aliphatic hydrocarbon residue having 1 to 10 carbon atoms,

R_2 is an aliphatic hydrocarbon residue having 1 to 10 carbon atoms, and

R_3, R_4 and R_5 are the same or different monovalent aliphatic hydrocarbon residues having 1 to 5 carbon atoms.

6. A room temperature curable composition which is at least substantially free of thiol comprising three components (A), (B) and (C) in which the component (A) comprises a fluorocarbon copolymer, a metallic oxide, a liquid epoxy resin, and organic solvent; the component (B) comprises a silane according to the general formula (i) namely



in which

R_1 is an aliphatic hydrocarbon residue having 1 to 10 carbon atoms,

R_2 is an aliphatic hydrocarbon residue having 1 to 10 carbon atoms, and

R_3, R_4 and R_5 are the same or different monovalent aliphatic hydrocarbon residues having 1 to 5 carbon atoms; and the component (C) comprises a primer composition comprising organic material having isocyanate groups and hydrolysable silane groups available for reaction and organic solvent, the composition being such that when the component (C) is applied to titanium substrate as a primer composition and the components (A) and (B) are mixed (in proportions to initiate at room temperature reticulation of the fluorocarbon copolymer) and applied to the primed substrate, the composition cures to provide a heat resistant, fuel resistant layer adhesively bonded to the substrate.

4,595,719

COMPOSITION FOR CLEANING AND CLEARING PLASTIC SURFACES

Jefferson K. Allen, 10 Hall Ave., Nashua, N.H. 03060

Division of Ser. No. 331,489, Dec. 17, 1981, Pat. No. 4,479,985.

This application Oct. 30, 1984, Ser. No. 666,563

Int. Cl.[4] C08L *67/00*; C09K *3/18*

U.S. Cl. 523—500 **5 Claims**

1. A formulation for cleaning and coating acrylic sheets to prevent clouding which consists essentially of:

a nonvolatile oil-monomer modified alkyd resin the monomer selected from the group consisting of styrene, vinyltoluene, diisocyanate and acrylic monomers and a volatile solvent; the solvent being a petroleum distillate having a boiling point range between 150° to 180° C., the nonvolatile resin comprising 22% to 29% by weight of the composition and the volatile solvent comprising 78% to 71% by weight which composition forms a clear film which prevents the transparent sheet from clouding.

4,595,720

PROCESSING ELASTOMERS

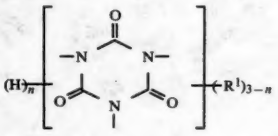
David A. Stivers, and Richard A. Guenthner, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 538,378, Oct. 3, 1983, abandoned. This application Jun. 26, 1985, Ser. No. 749,123

Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—100 **21 Claims**

1. A composition comprising fluoroelastomer gum and as a processing aid therefor a composition comprising isocyanurate of the formula:

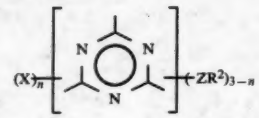


where

R^1 is an aliphatic radical or aryl radical, or combinations thereof, which radicals are unsubstituted or can contain hetero atoms, chlorine, or fluorine, not more than one of said radicals containing ethylenic unsaturation, and

n is 0, 1, or 2,

or cyanurate of the formula:



where
Z is O, S, or NR (where R is H or lower alkyl),
R^2 is as defined above for R^1,
X is halogen, OH, $O(M)_{1/z}$ (where M is a metal ion and z is the valence thereof), or NHR (where R is H or lower alkyl), and
n is 0, 1, or 2.

4,595,721

COMPOUNDS USEFUL AS STABILIZING AGENTS FOR RUBBER VULCANIZATES

Albert F. L. G. Devaux, Mont Saint Guibert, and Philippe G. Moniotte, Heron, both of Belgium, assignors to Monsanto Europe, S.A., Brussels, Belgium

Filed Jun. 4, 1984, Ser. No. 617,070

Claims priority, application United Kingdom, Jun. 10, 1983, 8315978

Int. Cl.[4] C08K *5/20*; **C07C** *147/02, 143/68, 149/415, 149/41, 149/40, 149/26, 149/237, 149/23, 149/22*

U.S. Cl. 524—160 **12 Claims**

1. A vulcanizable rubber composition comprising a diene rubber, sulphur and a vulcanization accelerator, characterized in that the composition also comprises a stabilizer material for protection against overcuring having the formula:

R-S-B-S-R

wherein B is an organic bridging group selected from the group consisting of an alkylene or alkenylene radical having 2 to 40 carbon atoms which is optionally substituted by one or more aryl substituents, a cycloalkylene, a (C_{1-6} alkylene)cycloalkylene, a (C_{1-6} alkylene)alkylcycloalkane or one of the structures having the following formulae:

$-(CH_2)_a-O-(CH_2)_a-$

$-(CH_2)_a-O-(CH_2)_{a'}-O-(CH_2)_a-$

$-(CH_2)_b-A-(CH_2)_b-$

$-(CH_2)_c-COO-(CH_2)_a-$

and $-(CH_2)_c-COO-Y-OOC-(CH_2)_c-$,

where each a' and each c independently represents an integer of from 1 to 20, a represents an integer of from 2 to 20, each b independently represents an integer of from 1 to 10, A represents phenylene or cyclohexylene, and Y represents a group $-(CH_2)_c-$ or a group $-(CH_2CH_2O)_dCH_2CH_2-$ where d represents an integer of from 1 to 5 and R is a group having the formula:

where R^1 is H or C_{1-6} alkyl, and R^2 and R^3 are each independently CN, $CONHR^4$, COR^5, $COOR^5$, SO_2R^5, COOM or SO_2OM, where R^4 is H, C_{1-6} alkyl, phenyl or benzyl, R^5 is C_{1-6} alkyl, phenyl or benzyl, and one of R^2 and R^3 can also be H, M represents H, a monovalent metal, the equivalent of a multivalent metal, an ion derived from a mono-acid nitrogenous base or the equivalent of an ion derived from a poly-acid nitrogenous base.

8. A compound having the formula

R-S-B-S-R

where B is an alkylene group having from 5 to 16 carbon atoms and R is a group having the formula

where R^2 and R^3 are each independently CN, $CONHR^4$, $COOR^5$, SO_2R^5 where R^4 is H, C_{1-6} alkyl, phenyl or benzyl, R^5 is C_{1-6} alkyl, phenyl or benzyl.

4,595,722

THERMOPLASTIC COATING COMPOSITIONS

Christopher H. Such, Mount Eliza, Australia, assignor to Dulux Australia Ltd., Clayton, Australia

Filed Aug. 29, 1984, Ser. No. 645,396

Claims priority, application Australia, Sep. 9, 1983, PG1338; Aug. 16, 1984, PG6618

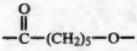
Int. Cl.[4] C08K *5/12*

U.S. Cl. 514—296 **6 Claims**

1. A thermoplastic coating composition wherein the film-forming composition comprises a solution in organic solvent of at least one acrylic polymer comprised of acrylic monomer and plasticiser for the polymer, the acrylic monomer comprising at least one of two types of polar group which strongly interact with each other, the composition being characterised in that

(a) each polar group is present to the extent that the monomer comprising that group comprises at least 4 mole percent of the total monomer; and

(b) there are present in the composition at least two plasticisers at least one of which is a phthalate ester plasticiser and at least one of which comprises per molecule at least one hydroxyl group and at least one grouping of the formula:



4,595,723

CORROSION INHIBITORS FOR ALKANOLAMINES

Edwin R. Henson; Tipton T. Masterson, both of Lake Jackson, and Joel G. Courtwright, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 29, 1984, Ser. No. 665,823

Int. Cl.[4] C08K *5/09*

U.S. Cl. 524—398 **8 Claims**

1. A corrosion inhibiting composition for ferrous metals and its alloys in gas conditioning service using aqueous monoethanolamine to scrub carbon dioxide containing oxygen comprising:

(a) a thiourea-aminopiperazine-formaldehyde polymer, and

(b) a nickel ion producing material selected from the group consisting of nickel (II) salts, nickel (II) complexes and combinations thereof, wherein said thiourea-aminopiperazine-formaldehyde polymer is combined with said nickel ion producing material in a ratio of from 2 to 4 parts thiourea-aminopiperazine-formaldehyde polymer to 1 part nickel ion producing material.

4,595,724

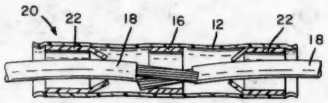
FLAME RETARDANT SEALANT

Francis F. Koblitz, York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 573,526, Jan. 24, 1984, abandoned. This application Aug. 5, 1985, Ser. No. 763,076

Int. Cl.[4] C08K *3/22*; C08L *27/16*

U.S. Cl. 524—409 25 Claims



1. A fusible sealant composition for use with preinsulated electrical connectors having a heat recoverable sleeve, the connectors essentially comprising a conductor connecting means positioned within the heat recoverable sleeve, the conductor connecting means being designed to receive and electrically connect two or more electrical conducting members, the members being inserted from the ends of the sleeve, and at least one fusible sealant insert member made of said composition positioned near at least one of the open ends of the sleeve, the composition being characterized in that:

the sealant is a homogeneous mixture comprised of polyvinylidene fluoride, a methacrylate polymer, and antimony oxide,

the polyvinylidene fluoride comprises from about 64 percent to about 93 percent by weight of the mixture,

the methacrylate polymer comprises from about 3 percent to about 32 percent by weight of the mixture,

the antimony oxide comprises approximately 4 percent by weight of the mixture whereby,

upon application of sufficient heat to the sleeve, the sleeve recovers around the conductor connecting means and the electrical conducting members, and said at least one fusible sealant insert member softens, conforms and adapts to an associated said conducting member, adheres to the conducting member and the sleeve, and seals the interstices between the conducting member and the recovered sleeve.

4,595,725

UNSATURATED POLYESTER RESINS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE FOR THE PRODUCTION OF MOLDING COMPOSITIONS

Bernhard Hess, Moers; Bert Brassat, and Bernhard Peltzer, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,235

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411150

Int. Cl.[4] C08G *63/76, 63/52, 63/54*

U.S. Cl. 525—33 16 Claims

1. An unsaturated polyester resin comprising

A. from 30 to 70 parts, by weight of the resin, of α,β-ethylenically unsaturated polyester and

B. from 30 to 70 parts, by wieght of the resin, of monomer copolymerizable with polyester A, where polyester A is comprised of residues formed by the reaction of

(a) at least one α,β-ethylenically unsaturated dicarboxylic acid and/or its anhydride,

(b) at least one hydrogenated phthalic acid and/or its anhydride,

(c) at least one ether glycol,

(d) at least one branching agent, and where the dicarboxylic acid residues (a) are comprised of at least 15 mole % fumaric acid residues, based on dicarboxylic acid residues (a),

the content of dicarboxlylic acid residues (a) amounts to at most 30 mole %, based on the sum of the polycarboxylic acid residues,

the content of ether glycol residues amounts to between 0.2 and 0.5 moles of ether groups per 100 g of polyester A,

the content of branching agent residues amounts to between 1 and 15 mole %, based on the sum of the alcohol residues,

the acid number of polyester A is less than 50 and hydroxyl number of polyester A is less than 70.

4,595,726

N-ALKYL METHACRYLATE MODIFIED POLYPROPYLENE

Daniel W. Klosiewicz, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 4, 1984, Ser. No. 657,443

Int. Cl.[4] C08L *53/04*

U.S. Cl. 525—71 2 Claims

1. A polymer blend comprising polypropylene, a rubbery ethylene—propylene copolymer present in an amount up to about 30% and about 10–30% by weight, based on total weight of the blend, of a graft copolymer of polypropylene and an alkyl methacrylate wherein

(a) the methacrylate moiety is present in the amount of about 3 to 30% by weight, based on the weight of the polypropylene backbone; and

(b) the alkyl portion of the alkyl methacrylate moiety has the general formula $—CH_2—R$ and R is a 1 to 5 carbon alkyl residue.

4,595,727

BLENDS OF A POLYGLUTARIMIDE WITH A RUBBER-MODIFIED VINYL CHLORIDE RESIN

Kenneth W. Doak, 3469 Burnett Dr., Murrysville, Pa. 15668

Filed May 2, 1985, Ser. No. 729,819

Int. Cl.[4] C08L *51/04, 33/24, 33/12, 27/06*

U.S. Cl. 525—71 15 Claims

1. A thermoplastic blend comprising:

10–90 percent by weight of a olyglutarimide prepared by reacting an acrylic polymer with an aminating agent selected from the group consisting of ammonia and an amine selected from the group consisting of alkyl and aryl amines containing 1 to 20 carbon atoms; and

90–100 percent by weight of a rubber-modified vinyl chloride resin prepared by polymerization of vinyl chloride in the presence of 2 to 50 percent, based on the weight of the resin, of a rubber to form a graft copolymer, which rubber-modified vinyl chloride resin contains 0–80 percent by weight of an unmodified vinyl chloride resin, based on the total weight of the resin.

4,595,728

IMPACT-RESISTANT METHACRYLIC RESIN COMPOSITION

Yoshio Nakai, Iwakuni, and Masamitsu Tateyama, Yamaguchi, both of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Nov. 1, 1984, Ser. No. 667,345

Claims priority, application Japan, Nov. 2, 1983, 58-204896

Int. Cl.[4] C08L *31/06, 33/04*; C08F *265/04*

U.S. Cl. 525—81 9 Claims

1. An impact-resistant methacrylic resin composition which comprises a graft copolymer (II) obtained by polymerizing 10 to 900 parts by weight of a monomer or monomeric mixture (B) comprising 80 to 100% by weight of methyl methacrylate and 20 to 0% by weight of at least one vinyl or vinylidene monomer copolymerizable therewith in the presence of 100 parts by weight of an acrylic elastomer (I) obtained by polymerizing a monomeric mixture (A) comprising 9.9 to 29.9% by weight of at least one monomer selected from the group consisting of styrene and derivatives thereof, 70 to 90% by weight

of at least one alkyl ester of acrylic acid having an alkyl group having 2 to 8 carbon atoms, 0.1 to 5% by weight of at least one monomer selected from the group consisting of diallyl isophthalate and diallyl terephthalate, and 0 to 5% by weight of a crosslinkable monomer other than diallyl isophthalate or diallyl terephthalate which is copolymerizable with the foregoing monomers and which has at least 2 carbon-to-carbon double bonds.

4,595,729

POLYCARBONATE/ADDITION POLYMER BLENDS

Daniel W. Fox, Pittsfield; Edward N. Peters, Lenox, and Gary F. Smith, Pittsfield, all of Mass., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 451,181, Dec. 20, 1982, Pat. No. 4,511,693, which is a continuation-in-part of Ser. No. 259,524, May 1, 1981, abandoned. This application Jan. 18, 1985, Ser. No. 692,773

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—147 **20 Claims**

1. A thermoplastic resin composition comprising:

(a) a mixed polycarbonate comprising units derived from a first dihydric phenol, which is a bis(hydroxyaryl)sulfone, and a second dihydric phenol said first and second dihydric phenols in a mole ratio of about 1:5 to 5:1; and

(b) one or more thermoplastic addition polymers containing hetero groups, selected from alkyl acrylate resins, vinyl chloride polymers, or combinations thereof, said composition having been admixed to produce a compatible composition.

4,595,730

GRAFTED POLYMER FROM UNSATURATED POLYAMIDE HAVING SINGLE OLEFINIC DOUBLE BOND

Philippe Blondel, and Camille Jungblut, both of Bernay, France, assignors to Atochem, Courbevoie, France

Filed Oct. 31, 1984, Ser. No. 666,895

Claims priority, application France, Nov. 4, 1983, 83 17523

Int. Cl.[4] C08G *69/48*

U.S. Cl. 525—178 **6 Claims**

1. A low temperature, thermoplastic, flexible, shock resistant grafted polymer obtained by grafting a polymer having a single olefinic double bond and comprising a polyamide chain containing from 2 to about 120 monomeric units terminated at only one end by a group having said olefinic double bond to at least one polymer selected from the group consisting of thermoplastic polymers, thermoplastic copolymers, elastomeric polymers and elastomeric copolymers, said grafting effected through said olefinic double bond.

4,595,731

WATER SOLUBLE POLYAMINES AND PROCESS FOR THEIR PREPARATION

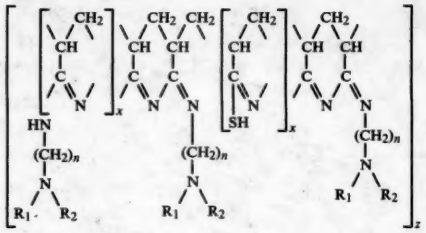
William K. Wilkinson, Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 654,198, Sep. 24, 1984, abandoned, which is a division of Ser. No. 492,488, May 6, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 771,147

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—329.1 **6 Claims**

1. A water soluble polyamine polymer having cyclic conjugated polyazomethine groups as part of the polymer backbone, comprised of the following structure



where z is 25–200, n is 2–20, R_1 and R_2 are 1–4 carbon alkyl groups and X is 1–4.

4,595,732

SILOXANE IMIDE DIOLS AND SILOXANE IMIDE ORGANIC BLOCK POLYMERS OBTAINED THEREFROM

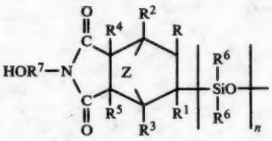
Hong-Son Ryang, Camarillo, Calif., assignor to General Electric Company, Schenectady, N.Y.

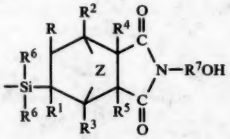
Filed Apr. 27, 1984, Ser. No. 604,570

Int. Cl.[4] C08G *63/18, 63/62, 73/14*

U.S. Cl. 525—417 **10 Claims**

1. Siloxane imide diols having the formula,





where R–R^5 are members selected from hydrogen, halogen, $C_{(1-13)}$ monovalent hydrocarbon radicals and halogenated $C_{(1-13)}$ monovalent hydrocarbon radicals, Z is selected from —O— and C—$(R)_2$—, R^6 is selected from $C_{(1-13)}$ monovalent hydrocarbon radicals, halogenated $C_{(1-13)}$ monovalent hydrocarbon radicals and cyanoalkyl radicals, R^7 is selected from divalent $C_{(2-13)}$ hydrocarbon radicals and n is an integer equal to 1–200 inclusive.

4,595,733

AROMATIC POLYCARBONATE CONTAINING THIENO-2-ONE-5,5-DIOXIDE TERMINAL GROUPS

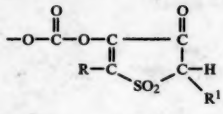
John A. Tyrell, and Gary L. Freimiller, both of Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Sep. 14, 1984, Ser. No. 650,866

Int. Cl.[4] C08G *63/62*

U.S. Cl. 525—462 **13 Claims**

1. Polycarbonate polymer having at least one terminal group represented by the general formula



wherein R and R^1 are independently selected from hydrogen or monovalent hydrocarbon radicals.

4,595,734

MOLDING COMPOSITIONS

Thomas P. O'Hearn, Minneapolis, Minn., assignor to Interplastic Corporation, Minneapolis, Minn.

Continuation of Ser. No. 660,270, Oct. 15, 1984, abandoned, which is a continuation of Ser. No. 410,764, Aug. 23, 1982, abandoned, which is a division of Ser. No. 118,233, Feb. 4, 1980, abandoned. This application Jun. 4, 1985, Ser. No. 741,192

Int. Cl.[4] C08L *63/02*

U.S. Cl. 525—524 **15 Claims**

1. Composition comprising the reaction product of

(a) an epoxide resin;

(b) a vinyl ester resin; and

(c) an organic polyfunctional amine; said epoxide resin and organic polyfunctional amine being present in a quantity greater than 0.25 amine equivalent per epoxide equivalent to provide a thickened reaction product having a viscosity between 50% greater than the vinyl ester resin within one day and the gelation point of the reaction product, and said thickened reaction product characterized by a measurable viscosity at ambient temperature below the gelation point of the reaction product for approximately at least one day with said epoxide resin and vinyl ester resin being present in a quantity such that terminal ethylenically unsaturated groups are equal to or greater in number than the terminal epoxide groups in the reaction product and containing a sufficient number of terminal ethylenically unsaturated groups for subsequent reaction.

4,595,735

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Takeshi Nomura; Kouji Maruyama; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 615,015, May 29, 1984, Pat. No. 4,544,648. This application Sep. 23, 1985, Ser. No. 779,179

Claims priority, application Japan, May 31, 1983, 58-94895

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—125 **6 Claims**

1. A process for the polymerization of alpha-olefins which comprises contacting under alpha-olefin polymerization conditions an olefin(s) in the presence of a catalyst system comprising an organoaluminum compound represented by the formula $R''''_nAlX''_{3-n}$, wherein R'''' is an alkyl or aryl group, X'' is a halogen, alkoxy group or hydrogen and n is $1 \leqq n \leqq 3$ and a catalyst component (b) which is obtained by contacting a magnesium compound represented by the formula Mg(OR-)(OR'), a haloganted hydrocarbon selected from the group consisting of mono or polyhalogen substitubed compounds of saturated or unsaturated aliphatic, alicyclic or aromatic hydrocarbons, a halogenated silane represented by the formula R''_mSiX_{4-m} and a titanium compound, wherein R and R', which may be the same or different, are alkyl, alkenyl, cycloalkyl, aryl and aralkyl groups, R'' is hydrogen or a hydrocarbon group containing from 1 to about 10 carbon atoms, X is a halogen atom and m is 0, 1, 2 or 3.

2. The polymerization process of claim 1 wherein the magnesium compound is contacted sequentially with the halogenated hydrocarbon, silane and titanium compound.

4. The polymerization process of claim 2 wherein the magnesium compound is contacted with a magnesium halide prior to contact with the halogenated hydrocarbon.

4,595,736

THERMALLY STABLE DRILLING FLUID ADDITIVE COMPRISED OF A COPOLYMER OF CATECHOL-BASED MONOMER

Arvind D. Patel, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

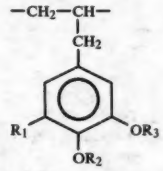
Division of Ser. No. 501,900, Jun. 7, 1983, Pat. No. 4,525,562. This application Dec. 28, 1984, Ser. No. 687,438

Int. Cl.[4] C08F *122/04, 12/24;* **C09K** *7/00*

U.S. Cl. 526—271 **9 Claims**

1. A water soluble polymer having thermal stability and exhibiting utility as an aqueous drilling fluid additive comprising:

(a) a major portion of a catechol based monomer having the formula:



wherein R_1 is a hydrogen, hydroxyl or methoxy; wherein R_2 is a hydrogen, methyl or part of a methylene group and where R_3 is a hydrogen, methyl or part of a methylene group; and

(b) a minor portion of a dicarboxylic acid monomer.

4,595,737

WATER-SOLUBLE TERPOLYMERS AND THEIR PREPARATION

Ferdinand Straub, Hockenheim; Oral Aydin, Mannheim; Wolfgang Linke, Ludwigshafen; Gerd Schroeder, Limburgerhof, and Peter Fickeisen, Dirmstein, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 748,986

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423446

Int. Cl.[4] C08F *26/08*

U.S. Cl. 526—264 **11 Claims**

1. A water-soluble terpolymer which contains, as copolymerized units,

(a) from 10 to 35% by weight of an N-vinyllactam or an N-vinyl acid amide,

(b) from 5 to 20% by weight of acrylic acid or of a salt of acrylic acid and

(c) from 80 to 50% by weight of a C_1–C_4-alkyl vinyl ether, and which has a glass transition temperature T_g below 60° C.

4,595,738

POLYPROPYLENE FILM

Walter Hufnagel, Forchheim, and Heinz Vates, Fürth-Stadeln, both of Fed. Rep. of Germany, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 151,911, May 21, 1980, abandoned. This application Mar. 29, 1985, Ser. No. 717,573

Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920514

Int. Cl.[4] C08J *5/18*

U.S. Cl. 526—348.1 **6 Claims**

1. A simultaneously biaxially oriented isotactic polypropyl-

ene film, resistant to dynamic stresses, particularly tensile stresses in longitudinal direction, which has been stretched in a surface stretch ratio of at least 1:45, and exhibits the following properties:

(a) a puncture resistance (according to DIN No. 53,373) corresponding to a damaging strength of 6000N/mm^2 or more, a damaging energy of 35 J/mm^2 or more and a damaging elongation of about 12.5 mm

(b) an elongation factor D_W of 0.003 mm. % or less, preferably of not more than 0.0025 mm. %, measured as residual irreversible elongation in longitudinal direction after 50 stress variations between 2 and 8N in a test strip of 15 mm width at 23° C.;

(c) an elongation factor D_{23} of 0.004 mm. % or less, preferably of not more than 0.003 mm. %, measured at a single elongation of a test strip of 15 mm width by a stress of 2N at 23° C.; and

(d) an elongation factor D_{80} of 0.05 mm. % or less, preferably of not more than 0.04 mm. %, measured at a single elongation of a test strip of 15 mm width by a stress of 2N at 80° C.

4,595,739

α-KETONE ACETYLENIC INHIBITED PLATINUM GROUP METAL CATALYZED ORGANOPOLYSILOXANE COMPOSITIONS

Jacques Cávezzan, Villeurbanne, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Oct. 26, 1984, Ser. No. 665,448

Claims priority, application France, Oct. 26, 1983, 83 17053

Int. Cl.^{4} C08L *83/05*

U.S. Cl. 528—15 **14 Claims**

1. An organopolysiloxane composition of matter which comprises:

(1) at least one organopolysiloxane comprising at least one vinyl radical per molecule, the remaining radicals thereof comprising mono- or divalent organic radicals which do not adversely affect the platinum group metal catalytic cross-linking thereof;

(2) at least one organohydropolysiloxane comprising at least three hydrogen atoms bonded to silicon per molecule, the remaining radicals thereof comprising mono- or divalent organic radicals which do not adversely affect the platinum group metal catalytic cross-linking of said organopolysiloxane (1), wherein the ratio between the hydrogen atoms bonded to silicon in said organohydropolysiloxane (2) and the sum of the vinyl, alkenyl and alkynyl radicals bonded to silicon in said organopolysiloxane (1) is at least 0.5:1;

(3) from about 5 to 1,000 ppm of a platinum group metal catalyst to cross-link said organopolysiloxane (1) with said organohydropolysiloxane (2); and

(4) from about 0.01 to 3% of at least one platinum catalysis inhibitor comprising a ketone compound having a boiling point of at least 25° C., at least one site of acetylenic unsaturation and a carbonyl group in the α-position to the carbon atoms constituting said site of acetylenic unsaturation.

4,595,740

POLYMERIC MONO-, DI-,TRI- AND TETRA-SULFIDE COMPOUNDS, PROCESS FOR PRODUCTION AND USE THEREOF

Peter Panster, Rodenbach, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 13, 1983, Ser. No. 513,193

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3226091

Int. Cl.^{4} C08G *77/22*

U.S. Cl. 528—30 **31 Claims**

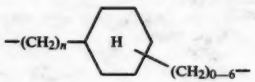
1. A solid polymeric mono-, di-, tri- or tetra-sulfide compound, which is insoluble in water and insoluble in organic solvents, having an organopolysiloxane base structure comprising units of the formula:

$$R^1—S[i]_{1-4}—R^2 \quad (1)$$

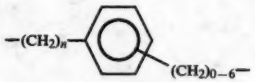
wherein R^1 and R^2 are the same or different and represent a group of the formula:

$$R^3—SiO_{3/2} \quad (2)$$

wherein R^3 is a linear or branched alkylene with 1 to 12 C-atoms, cycloalkylene with 5 to 8 C-atoms,



or



wherein n is an integer from 1 to 6 and represents the number of sulfur attached methylene groups, wherein the methylene group is directly bonded to the sulfur in formula (1);

the free valencies of the oxygen atoms are either saturated by silicon atoms of additional groups of the formula (2) and/or by cross-linking bridge members

$SiO_{4/2}$

or

$R'SiO_{3/2}$

or

$R_2'SiO_{2/2}$

$TiO_{4/2}$

or

$R'TiO_{3/2}$

or

$R_2'TiO_{2/2}$

$AlO_{3/2}$

or

$R'AlO_{2/2}$

wherein R' is methyl or ethyl and the ratio of the silicon atoms in formula (2) to the bridging atoms silicon, titanium and aluminum ranges from 1:0 to 1:10.

4,595,741

METHOD FOR PRODUCING POLYURETHANE RESINS

Yoshio Kamatani, Osaka, and Takurou Sakamoto, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 16, 1984, Ser. No. 672,191

Claims priority, application Japan, Nov. 18, 1983, 58-217989

Int. Cl.^{4} C08G *18/18, 18/77*

U.S. Cl. 528—53 **27 Claims**

1. A method for producing a polyurethane resin which

comprises contacting a compound having a 1-oxa-3,5-diazine-2,4,6-trione ring and an isocyanate group and a compound having active hydrogen with a tertiary amine present in the gaseous phase; the compound having a 1-oxa-3,5-diazine-2,4,6trione ring and an isocyanate group being a reaction product of an aliphatic or alicyclic polyisocyanate with carbon dioxide and the compound having active hydrogen being a polyol having at least two active hydrogens and a molecular weight of 62 to 100,000.

4,595,742

DI(ALKYLTHIO)DIAMINE CHAIN EXTENDERS FOR POLYURETHANE ELASTOMERS

Christopher J. Nalepa; Paul F. Ranken, and Karl E. Wiegand, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 4, 1985, Ser. No. 708,028
Int. Cl.[4] C08G *18/32*; B29B *7/00*
U.S. Cl. 528—64 **30 Claims**

1. A polyurethane product formed by reacting a polyisocyanate; an organic active hydrogen group-containing compound; and a chain extender comprising an aromatic diamine having at least one aromatic ring, one of said at least one aromatic ring having thereon at least two alkylthio substituents and at least one amino substituent.

4,595,743

HIGH MODULUS POLYUREA ELASTOMERS PREPARED WITH AMINE-INITIATED POLYOLS

Michael K. Laughner; James R. Porter, and Lee M. Huber, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1985, Ser. No. 693,718
Int. Cl.[3] C08G *18/32*
U.S. Cl. 528—73 **21 Claims**

1. A polyurea or polyurea-polyurethane elastomer which is the reaction product of reaction mixture comprising (a) an organic polyisocyanate, (b) a low equivalent weight aromatic amine chain extender in an amount from about 15 to 60 parts by weight based on the weight of isocyanate reactive components present in said reaction mixture, (c) an amount of an amine-initiated polyol sufficient to provide the elastomer with a measurably decreased brittleness at demold as compared to a similar elastomer prepared in the absence of said amine initiated polyol.

4,595,744

LOW MELTING POINT DIPHENYLETHANE DIISOCYANATE MIXTURES, METHOD OF MAKING THE SAME, AND POLYURETHANES MADE THEREFROM

Jacques Kervennal, Lyons, and Henri Mathais, St-Didier-au-Mont-d'Or, both of France, assignors to Atochem, France

Filed Dec. 7, 1984, Ser. No. 679,571
Claims priority, application France, Dec. 21, 1983, 83 20458
Int. Cl.[4] C08G *18/76*
U.S. Cl. 528—83 **5 Claims**

1. A low melting point composition comprising a mixture of diisocyanate isomers having the diphenylethane structure and containing by weight about:

35 to 55% of the 2,4′ isomer,
15 to 40% of the 4,4′ isomer,
10 to 25% of the 2,2′ isomer,
3 to 10% of the 3,4′ isomer, and
3 to 8% of the 2,3′ isomer.

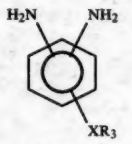
4,595,745

ORGANIC SOLVENT-SOLUBLE PHOTOSENSITIVE POLYAMIDE RESIN

Tsunetomo Nakano; Hiroshi Yasuno, and Kazuaki Nishio, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Jun. 21, 1984, Ser. No. 622,859
Claims priority, application Japan, Jun. 27, 1983, 58-115432; Dec. 12, 1983, 58-234026
Int. Cl.[4] C08G *69/26, 69/40*
U.S. Cl. 528—125 **10 Claims**

1. An organic solvent-soluble photosensitive polyamide resin comprising a polycondensation product of an aromatic dicarboxylic acid component consisting of at least one member selected from the group consisting of aromatic carboxylic acids and acid halides thereof with an aromatic diamine component consisting of 10 to 100 molar % of at least one member selected from the group consisting of diamino chalcone compounds and aromatic diamine compounds of the formula



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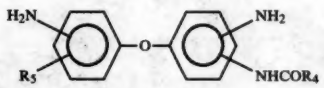
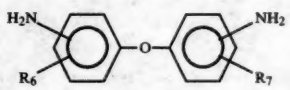


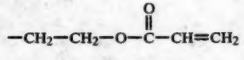
(IV)

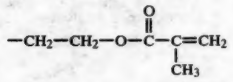
and

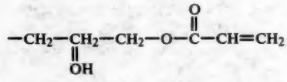


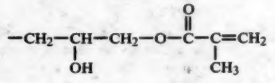
(V)

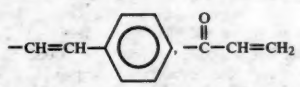
wherein X represents a divalent radical selected from the group consisting of —CO—O— and —CH_2—O—; R_3 represents a radical selected from the group consisting of











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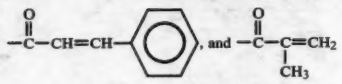
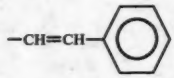


R_4 represents a member selected from the group consisting of —CH=CH_2 and



R_5 represents a member selected from the group consisting of hydrogen and —NH—CO—R_4; R_6 represents a member selected from the group consisting of hydrogen and alkyl having from 1 to 5 carbon atoms; and R_7 represents a member selected from the group consisting of CH_2=CH—$COOCH_2C$-H_2OOC— and CH_2=$C(CH_3)$—$COOCH_2CH_2OOC$—; and 0 to 90 molar % of at least one aromatic diamine compound of the formula (II):

$$H_2N—R_2—NH_2 \quad (II)$$

in which formula (II) R_2 represents a nonphoto crosslinkable aromatic divalent residue.

4,595,746

PROMOTION OF ϵ-CAPROLACTAM POLYMERIZATION WITH LACTAM MAGNESIUM HALIDE CATALYST AND 2-OXO-1-PYRROLIDINYL GROUPS

James D. Gabbert, Wilbraham, Mass., and Ross M. Hedrick, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 17, 1984, Ser. No. 682,717

Int. Cl.[4] C08G *69/20*

U.S. Cl. 528—312 **38 Claims**

1. A storage stable composition suitable for admixing with a catalytically effective amount of a C_3 to C_{12} lactam magnesium halide to provide an admixture which polymerizes to form a nylon-6 polymer, said composition comprising (a) ϵ-caprolactam, (b) an effective amount of an initiator compound or precursor thereof, said initiator coreactant compound being capped with at least one activated group capable of initiating ϵ-caprolactam polymerization in the presence of the catalyst, and (c) a sufficient amount of 2-oxo-1-pyrrolidinyl groups, present in the composition as 2-pyrrolidinone or as N-lactam groups of the initiator coreactant compound, to provide a concentration of 2-oxo-1-pyrrolidinyl groups in the range of about 0.05 to about two equivalents per equivalent of the initiator coreactant compound or precursor thereof.

4,595,747

VISCOSIFIED LACTAM POLYMERIZATION INITIATOR SOLUTIONS

James D. Gabbert, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 17, 1984, Ser. No. 682,718

Int. Cl.[4] C08G *69/20*

U.S. Cl. 528—319 **35 Claims**

1. A composition comprising a lactam monomer, a lactam polymerization initiator coreactant and an effective amount of a viscosity enhancing compound selected from the group consisting of the lactamates and ω-amino acid salts of barium, calcium, and strontium, wherein the lactam polymerization initiator coreactant is a telechelic oligomer or polymer containing at least one activated N-substituted lactam group and comprises a backbone which provides elastomeric segments in a nylon block copolymer produced therefrom by lactam addition polymerization.

4,595,748

PROCESS FOR THE PREPARATION OF HIGH MOLECULAR WEIGHT, OPTIONALLY BRANCHED POLYARYLENE SULPHIDES

Edgar Ostlinning, Duesseldorf, and Karsten Idel, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 661,201

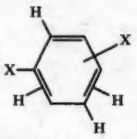
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338501

Int. Cl.[4] C08G *75/14*

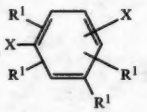
U.S. Cl. 528—388 **7 Claims**

1. In an improved process for the preparation of high molecular weight polyarylene sulphide by reacting:

(a) 50–100 mol-% of dihalogenated aromatic compound corresponding to the formula



and 0–50 mol-% of dihalogenated aromatic compound corresponding to the formula



wherein

X represents halogen in the meta- or para-position to each other and

R^1, which may be identical or different, represents hydrogen, alkyl, cycloalkyl, aryl, alkylaryl or arylalkyl, and two of the R^1 groups in the ortho-position to each other may be linked together to form an aromatic or heterocyclic ring, and one R^1 always represents a substituent other than hydrogen, and

(b) 0 to 5 mol-%, based on the sum of components (a) and (b), of a tri- or tetra-halogenated aromatic compound corresponding to the formula

$$ArX_n$$

wherein

Ar represents an aromatic or heterocyclic group,

X represents chlorine or bromine and

n represents the integer 3 or 4, and

(c) alkali metal sulphide or alkali metal sulphide mixed with alkali metal hydroxides, the molar ratio of (a+b):c lying in the range of from 0.85:1 to 1.15:1, and

(d) an organic solvent wherein the molar ratio of alkali metal sulphide (c) to the organic solvent (d) lies within the range of from 1:2 to 1:15,

the improvement comprises heating a mixture of reactants which are anhydrous to 150° to 205° C., whereupon the reactants containing water are then added at such a rate that the water introduced with the water-containing reactants is distilled off continuously to thereby obtain and maintain an anhydrous reaction mixture and subsequently conducting the reaction in the absence of water at temperatures of from 210° to 270° C.

4,595,749

DIRECT REMOVAL OF NI CATALYSTS

Ronald J. Hoxmeier, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 23, 1984, Ser. No. 673,978
Int. Cl.[4] C08F 6/00
U.S. Cl. 528—483 16 Claims

1. A method is provided for treating water insoluble hydrogenated polymer solutions contaminated with one or more metals, selected from the group consisting of iron, nickel, cobalt, lithium and aluminum, said method comprising treating said solution with one or more dicarboxylic acids and an oxidant selected from the group consisting of oxygen, hydrogen peroxide and aryl and alkyl hydroperoxides, thereby forming insoluble metal containing polymers and separating said metal-containing polymers from the polymer solution thereby removing the contaminating metal residues.

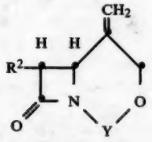
4,595,750

PROCESS FOR CHIRAL SYNTHESIS OF 1-β-METHYLCARBAPENEM INTERMEDIATES

Burton G. Christensen, Cliffside Park; Lovji D. Cama, Cresskill, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 703,053, Feb. 19, 1985, abandoned. This application Aug. 29, 1984, Ser. No. 771,148
Int. Cl.[4] C07D 498/01; C07F 7/10, 7/18
U.S. Cl. 544—90 12 Claims

1. A process for stereoselectively reducing an exocyclic methylene double bond in a bicyclic compound of the structural formula:



(I)

wherein R^2 is independently H, linear or branched C_1–C_3 alkyl, which can be substituted with fluoro or hydroxy, and Y is a divalent bridging-protecting group derived from a ketone, aldehyde or organosilicon compound, said group being stable to catalytic hydrogenation and removable by acid or base hydrolysis, said process comprising the step of contacting said compound with a hydrogen atmosphere in the presence of a supported or unsupported Group VIII transition metal hydrogenation catalyst and in the presence of a solvent for said bicyclic compound, at a temperature below the boiling point of the solvent, for a sufficient time to yield a mixture of α- and β-methyl epimers having an β/α molar ratio, of greater than 1.

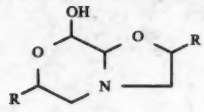
4,595,751

PERHYDRO-[2,3-C]-OXAZOLO-1,4-OXAZINES AND THEIR PROCESS OF PREPARATION

Alain Blanc, Paris, France, assignor to Societe Francaise Hoechst, Puteaux, France

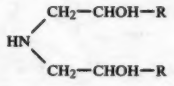
Filed Mar. 20, 1985, Ser. No. 713,797
Claims priority, application France, Mar. 26, 1984, 84 04655
Int. Cl.[4] C07D 498/04
U.S. Cl. 544—105 7 Claims

1. Perhydro-[2,3-c]-oxazolo-1,4-oxazine having the general formula (I):



in which R represents a hydrogen atom or a C_1–C_5-alkyl radical.

4. A process for obtaining compounds such as defined in the general formula (I) of claim 1, comprising reacting at a temperature lower than 30° C. one mole of glyoxal with one mole of diethanolamine of the general formula (II):



(II)

in which R has the meaning given for formula (I) of claim 1.

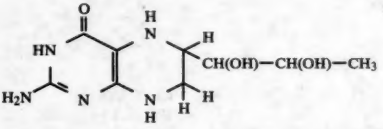
4,595,752

PROCESS FOR PREPARING 5,6,7,8-TETRAHYDRO-6-(L-ERYTHRO-1',2'-DIHYDROXYPROPYL)PTERIN

Masaaki Azuma; Takehisa Ohashi, both of Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

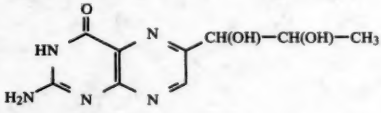
Filed Feb. 21, 1985, Ser. No. 703,976
Claims priority, application Japan, Feb. 23, 1984, 59-33839
Int. Cl.[4] C07D 475/04
U.S. Cl. 544—258 17 Claims

1. A process for preparing 5,6,7,8-tetrahydro-6-(L-erythro-1',2'-dihydroxypropyl)pterin having the formula (II):



(II)

which comprises hydrogenating 6-(L-erythro-1',2'-dihydroxypropyl)pterin having the formula (I):



(I)

in the presence of a platinum group catalyst in a basic medium selected from the group consisting of an aqueous solution of an alkali metal salt of a weak acid, an aqueous solution of an alkali metal hydroxide, an aqueous solution of calcium hydroxide and an aqueous solution of barium hydroxide to give 5,6,7,8-tetrahydro-6-(L-erythro-1',2'-dihydroxypropyl)pterin of the formula (II) which is rich in the (6R) form.

4,595,753

HETEROCYCLE-SUBSTITUTED ALKYL DIARYL PHOSPHINE RHODIUM CARONYL HYDRIDE COMPLEX HYDROFORMYLATION CATALYST COMPOSITIONS

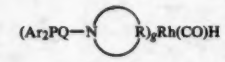
Alexis A. Oswald, Mountainside, N.J.; Torris G. Jermasen, Staten Island, N.Y.; Andrew A. Westner, Paramus, and I-der Huang, West Paterson, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 374,548, May 3, 1982, which is a division of Ser. No. 120,971, Feb. 12, 1980. This application Nov. 30, 1983, Ser. No. 556,610

Int. Cl.[4] C07F *9/58, 9/65*

U.S. Cl. 546—21 11 Claims

1. A nitrogen heterocycle substituted alkyl diaryl phosphine rhodium carbonyl hydride complex catalyst of the formula

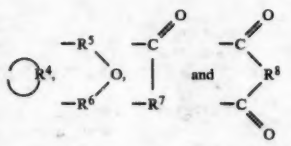


wherein

Ar is an aryl group containing from 6 to 10 carbon atoms;

Q is a divalent organic radical selected from an alkylene radical and an alkylene radical the carbon chain of which is interrupted at least one ether oxygen or phenylene group wherein said alkylene radical contains from 1 to 30 carbon atoms;

R represents a divalent organic radical selected from the group consisting of



which together with the nitrogen atom forms a heterocyclic nitrogen-containing ring wherein R^4, R^5, R^6, R^7 and R^8 are hydrocarbyl radicals such that said heterocyclic ring contains from 5 to 6 atoms; and g is 2 or 3.

4,595,754

PROCESS FOR PREPARING CIS N-ALKYLPERHYDROQUINOLINES

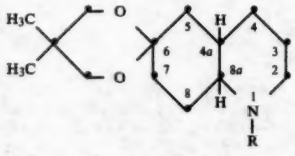
Randall K. Atkins, and Leland O. Weigel, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 4, 1985, Ser. No. 707,994

Int. Cl.[4] C07D *49/13, 319/08*

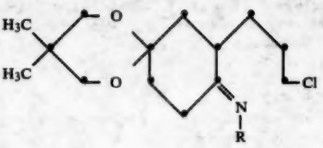
U.S. Cl. 546—18 10 Claims

1. A process for preparing a cis N-alkylperhydroquinoline of the formula



I

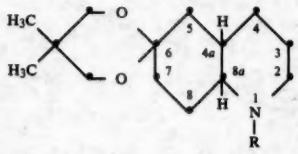
wherein R is C_1–C_3 alkyl, comprising reacting a 3-chloropropyl N-alkylamine of the formula



II

with a hydride reducing agent in the presence of an alcoholic solvent and a basic reaction medium at a temperature in the range of about −20° C. to about 25° C.

6. A compound of the formula



I

wherein R is C_1–C_3 alkyl, or an acid addition salt thereof.

4,595,755

5-HALO-1,2,3-(1,2-DIHYDROPYRROLO)-4-QUINOLONES

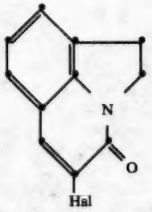
Pierre Martin, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 477,706, Mar. 22, 1983, Pat. No. 4,550,165. This application Jul. 29, 1985, Ser. No. 759,976

Int. Cl.[4] C07D *471/06*

U.S. Cl. 546—94 3 Claims

1. A 5-halo-1,2,3-(1,2-dihydropyrrolo)-4-quinolone of the formula



in which "Hal" is chlorine or bromine.

4,595,756

CATIONIC COMPOUNDS OF THE NAPHTHALIMIDE SERIES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Norbert Schönberger, Wehrheim; Erich Schinzel, Hofheim am Taunus; Thomas Martini, and Günter Rösch, both of Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

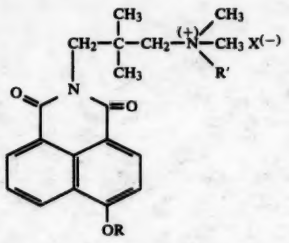
Continuation of Ser. No. 417,052, Sep. 13, 1982, Pat. No. 4,508,900, which is a continuation of Ser. No. 203,530, Nov. 3, 1980, abandoned. This application May 24, 1984, Ser. No. 613,461

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] C07D *221/14;* D06P *1/649;* C09B *17/04*

U.S. Cl. 546—99 4 Claims

1. Cationic compounds of the formula (1)



(I)

in which

R denotes alkyl, hydroxyalkyl, alkoxyalkyl, phenylalkyl, or phenoxyalkyl,

R′ denotes alkyl, hydroxyalkyl, benzyl, or allyl and

$X^{(-)}$ denotes a colorless anion.

4,595,757

N-ALKYLATED BENZO- AND HETERO-FUSED ANTISECRETORY AGENTS

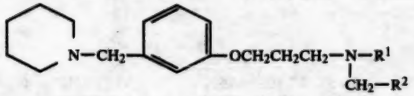
Guy A. Schiehser, Malvern, Pa.; Susan T. Nielsen, Wilmington, Del., and Donald P. Strike, St. Davids, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 13, 1984, Ser. No. 681,169

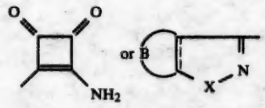
Int. Cl.[4] C07D *513/04, 417/12, 405/12*

U.S. Cl. 546—197 **5 Claims**

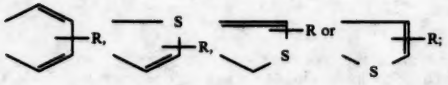
1. A compund having the formula



wherein R^1 is



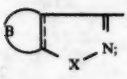
wherein B is a moiety having the formula



R is H, mono- or dihalo, amino, nitro, cyano, hydroxy, trifluoromethyl, mercapto, lower alkyl, lower alkoxy, alkanoyl of 2 to 5 carbon atoms, lowercycloalkyl, carboxy, alkoxycarbonyl of 2 to 7 carbon atoms, mono- or di-lower alkyl substituted amino, alkanoylamino of 2 to 5 carbon atoms, lower alkyl thio, loweralkylsulfonyl, sulfamoyl, lower alkyl substituted sulfamoyl, phenyl or phenyl substituted with halo, lower alkyl, lower alkoxy, trifluoromethyl, hydroxy, amino, cyano or nitro;

X is SO_2, SO, S, or C=O;

R^2 is phenyl or 1,3-benzodioxol-5-yl, with the proviso that R^2 is phenyl only when R^1 is



or a pharmacologically acceptable salt thereof.

4,595,758

ETHANEDIIMIDAMIDE INTERMEDIATES

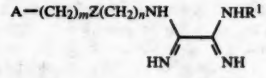
Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 600,864, Apr. 16, 1984, Pat. No. 4,577,366, which is a division of Ser. No. 473,791, Mar. 16, 1983, Pat. No. 4,528,377, which is a continuation-in-part of Ser. No. 363,207, Mar. 29, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 677,614

Int. Cl.[4] C07D *409/12*

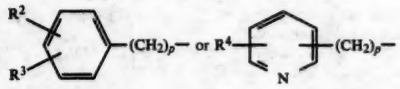
U.S. Cl. 546—212 **6 Claims**

1. A compound of the formula



(II)

wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



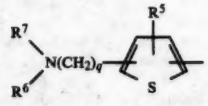
in which p is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 and R^3, taken together, may be methylenedioxy, and R^4 is hydrogen, (lower-)alkyl or (lower)alkoxy;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is



in which R^5 is hydrogen, (lower)alkyl or (lower)alkoxy, q is an integer of from 1 to 4 inclusive and R^6 and R^7 each are independently (lower)alkyl, (lower)alkoxy (lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, or phenyl(lower)alkyl, and, when R^6 is hydrogen, R^7 also may be cyclo(lower)alkyl, or R^6 and R^7, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, 3-azabicyclo[3.2.2]non-3-yl or 3-pyrrolino; or a salt, hydrate or solvate thereof.

6. The compound of claim 1 which is N-{2-[(5-piperidinomethyl-3-thienyl)methylthio]ethyl}ethanediimidamide, or a salt, hydrate or solvate thereof.

4,595,759
CYCLOHEXANE CARBOXYLIC ACIDS AND DERIVATIVES THEREOF AS ANTIDYSRHYTHMIC AGENTS

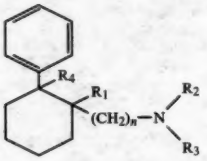
Thomas A. Davidson, Penfield, and Telfer L. Thomas, Pittsford, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 524,701, Aug. 19, 1983. This application Feb. 15, 1985, Ser. No. 701,797

Int. Cl.[4] C07D *211/06;* **C07C** *121/66, 103/85*

U.S. Cl. 546—234 **23 Claims**

1. A compound of the formula:



wherein R_1 is from the class of cyano, carboxyl, alkylcarboxylate, carboxamido, N-alkyl carboxamido and N,N-dialkylcarboxamido, R_2 and R_3 are from the class of hydrogen, cycloalkyl and lower alkyl with the proviso that such lower alkyl groups may be linked to form a heterocyclic group with the nitrogen, R_4 is from the class of hydrogen and hydroxyl and n is 2 or 3.

4,595,760
BIS-AMINOPYRIDINIUM SALTS

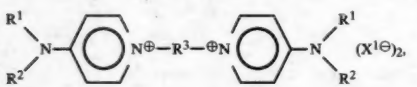
Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,713

Int. Cl.[4] C07D *401/06, 401/04*

U.S. Cl. 546—256 **12 Claims**

1. A bis-aminopyridinium salt having the formula



(I)

wherein:

R^1 and R^2 are identical alkyl radicals containing 1–13 carbon atoms or R^1 and R^2 together form a tetramethylene, pentamethylene or alkyl-substituted tetramethylene or pentamethylene radical;

R^3 is an alkylene or poly(oxyethylene) radical containing 4–25 atoms in a single chain connecting the quaternary nitrogen atoms; and

X^1 is an anion-forming atom or radical.

4,595,761
DICARBOXYLIC ACID AZOMETHINES AND HIGH GLASS TRANSITION TEMPERATURE POLYESTER PRODUCTS PRODUCED THEREFROM

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 15, 1985, Ser. No. 712,055

Int. Cl.[4] C07D *213/79, 213/36;* **C08G** *59/42*

U.S. Cl. 546—263 **7 Claims**

1. A carboxy terminated aromatic azomethine formed by reacting:

(A) aromatic compounds having the formula:

ORC—X—CRO,

wherein X is a phenyl group, each R is H or an alkyl group having 1–5 carbon atoms, and the CRO groups are linked through X at the 1,3 or 1,4 positions; and

(B) compounds having the formula

$H_2N—Y—(R')_n—COOH$:

wherein Y is a pyridine group, n is 0 or 1, R′ is an organic group, and the H_2N group and the COOH group are linked through Y at the 1,3 or 1,4 positions,

said compounds (A) and (B) being reacted in about a 1:2molar ratio and under conditions wherein said CRO groups of (A) and said NH_2 group of (B) react.)

4,595,762
5-α-BROMOALKANOYL-2-OXO-3-PYRIDINECARBONITRILES

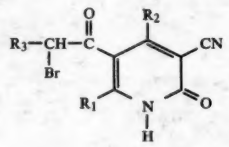
George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 571,281, Jan. 16, 1984, Pat. No. 4,539,327, which is a division of Ser. No. 411,558, Aug. 25, 1982, Pat. No. 4,469,699. This application Feb. 13, 1985, Ser. No. 701,316

Int. Cl.[4] C07D *213/57*

U.S. Cl. 546—288 **3 Claims**

1. 1,2-Dihydro-4-R_2-5-[R_3CH(Br)CO]-6-R_1-2-oxo-3-pyridinecarbonitrile having the formula



where R_1 is alkyl having from one to four carbon atoms, R_2 is hydrogen or methyl, and R_3 is hydrogen or alkyl having from one to three carbon atoms.

4,595,763
PROCESS FOR PREPARING METHYL ETHERS OR THIOETHERS OF ARYL COMPOUNDS

James M. Renga, and Pen-Chung Wang, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 284,035, Jul. 17, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 507,910

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.[4] C07C *41/01, 41/12, 43/02, 79/35*

U.S. Cl. 546—290 **6 Claims**

1. A process for preparing methyl aryl ethers or thioethers corresponding to the formula:

$ArXCH_3$

wherein:

when X is oxygen, Ar is phenyl, naphthyl or biphenyl, optionally substituted with up to three unreactive moieties selected from the group consisting of lower alkyl, lower alkoxy, halo, cyano, nitro, trifluoromethyl, aralkyl, and phenoxy provided that at most only two such moieties are cyano, nitro or aralkyl moieties; and

when X is sulfur, Ar is phenyl, naphthyl, biphenyl or pyridyl, optionally substituted with up to three unreactive moieties selected from the group consisting of lower alkyl, lower alkoxy, halo, cyano, nitro, trifluoromethyl, aralkyl and phenoxy provided that at most only two such moieties are cyano, nitro or aralkyl moieties, comprising contacting an aromatic hydroxyl- or thiol-containing compound of the formula ArXH, where Ar and X are as previously defined, with methyl trichloroacetate in the presence of a

catalytic amount of an initiator selected from the group consisting of phosphonium salts, alkali metal alkoxides, salts of a strong base and a weak acid, aliphatic tertiary amines and aromatic tertiary amines at a temperature from about 100° C. to 180° C.

4,595,764

PHOTOGRAPHIC PRODUCTS AND PROCESSES

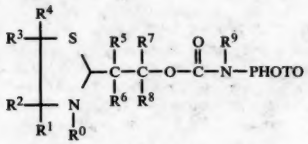
Roberta R. Arbree, Nashua, N.H.; James W. Foley, Andover, and Frank A. Meneghini, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 500,391, Jun. 2, 1983, Pat. No. 4,468,449. This application Jul. 23, 1984, Ser. No. 633,701

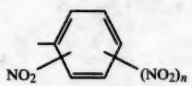
Int. Cl.⁴ C07D *277/04*

U.S. Cl. 548—201 **1 Claim**

1. A compound of the formula



wherein R^0 is selected from alkyl, aryl, aralkyl and alkaryl; R^1 is selected from hydrogen, carboxy, N,N-dialkylcarboxamido, alkyl, aryl, aralkyl and alkaryl; R^2, R^3 and R^4 each are selected from hydrogen, alkyl, aryl, aralkyl and alkaryl; R^5 is selected from hydrogen and carboxy; R^6, R^7 and R^8 each are selected from hydrogen, alkyl, aryl, aralkyl and alkaryl; R^9 is selected from hydrogen alkyl, aryl, aralkyl and alkaryl; and PHOTO is



wherein n is 0 or 1.

4,595,765

PROCESS FOR PREPARING 5,6-DIHYDROXYINDOLE

Bryan P. Murphy, Trumbull, Conn., assignor to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 533,171, Sep. 19, 1983, abandoned. This application Oct. 18, 1985, Ser. No. 788,510

Int. Cl.⁴ C07D *209/26*

U.S. Cl. 548—491 **8 Claims**

1. A method for preparing 5,6-dihydroxyindole in high yield and purity which comprises

subjecting 4,5-dihydroxy-2,β-dinitrostyrene to catalytic reductive cyclization with hydrogen in the presence of a platinum group metal catalyst which is palladium, platinum, rhodium or a mixture thereof in a polar hydroxylic solvent to produce 5,6-dihydroxyindole.

4,595,766

PROCESS FOR THE PREPARATION OF AN INDOLINE CARBOXYLIC ACID

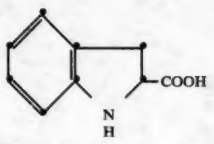
Achim Roloff, Rheinfelden, Switzerland, and Heinz W. Gschwend, New Providence, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 26, 1984, Ser. No. 664,916

Int. Cl.⁴ C07D *209/12*

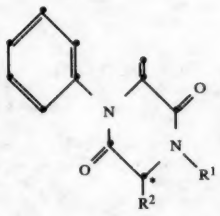
U.S. Cl. 548—491 **6 Claims**

1. A process for the preparation of the optically pure 2S- or 2R-indolinecarboxylic acid of the formula I



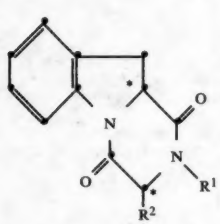
I

or a salt thereof, which comprises diastereoselectively cyclising photochemically a compound of the formula



II

wherein R^1 is hydrogen, lower alkyl or aryl-lower alkyl, R^2 is lower alkyl or lower alkyl which is substituted by lower alkoxy, lower alkylthio, aryl or lower alkoxyaryl, or is aryl, or wherein R^1 and R^2, when taken together, are lower alkylene which may be substituted by lower alkoxy or fused to a 5- to 7-membered carbocyclic ring and wherein the symbol * denotes a carbon atoms which is always either in the S or in the R configuration, to give a compound of the formula



III

wherein R^1 and R^2 have the given meanings and each symbol * denotes a carbon atom, with both carbon atoms together being either in the S configuration or in the R configuration, hydrolysing said compound with a strong acid and isolating the optically pure 2S- or 2R-indolinecarboxylic acid of formula I, or a metal, ammonium or acid addition salt thereof.

4,595,767

1,4-BENZODIOXINE AND 1,4-BENZODIOXINE DERIVATIVES AND PRODUCTION THEREOF

Hiroshi Itazaki, Hyogo; Kunio Hayashi; Munenori Matsuura, both of Osaka; Yukio Yonetani, Nara, and Masuhisa Nakamura, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

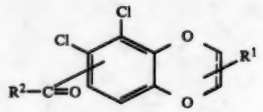
Filed Oct. 22, 1985, Ser. No. 791,160

Claims priority, application Japan, Nov. 14, 1984, 59-241506

Int. Cl.⁴ C07D *409/00, 319/14;* A61K *31/38*

U.S. Cl. 549—60 **2 Claims**

1. A compound of the formula:



wherein R^1 is optionally protected hydroxymethyl or carboxy; R^2 is hydrogen, straight or branched chain lower alkyl or lower alkenyl, C_4–C_7 cycloalkyl, optionally substituted phenyl, phenyl(lower alkyl), hydroxy, thienyl, or furyl; and the dotted line indicates the presence or absence of a double bond.

4,595,768

3-(SUBSTITUTED PHENYL)PHTHALIDES

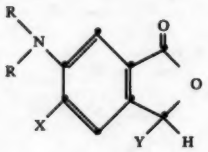
Paul J. Schmidt, Sharonville, and Nathan N. Crounse, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 793,544, May 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 726,482, Sep. 24, 1976, abandoned. This application Apr. 23, 1984, Ser. No. 602,991

Int. Cl.[4] C07D *305/14*

U.S. Cl. 549—307 **19 Claims**

1. A 3-Y-5-X-6-N(R)$_2$-phthalide of the formula

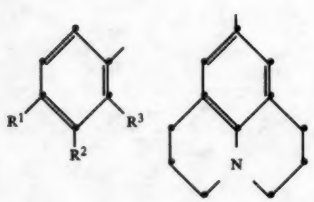


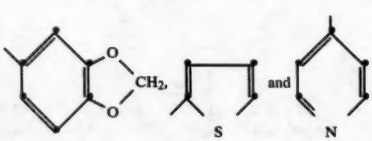
wherein:

R represents hydrogen, non-tertiary alkyl of one to four carbon atoms, benzyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms;

X represents hydrogen or halo; and

Y represents a monovalent moiety selected from the class having the formulas





in which:

R^1 represents hydrogen, non-tertiary alkoxy of one to four carbon atoms, dialkylamino or N-alkylbenzylamino in which alkyl is non-tertiary alkyl of one to four carbon atoms,

R^2 represents hydrogen, alkyl of one to three carbon atoms or non-tertiary alkoxy of one to four carbon atoms, and

R^3 represents hydrogen, alkyl of one to three carbon atoms, non-tertiary alkoxy of one to four carbon atoms, halo or dialkylamino in which alkyl is non-tertiary alkyl of one to four carbon atoms.

4,595,769

CARBAMATE-SULFENYL-CARBAMOYL FLUORIDE COMPOUNDS

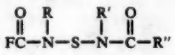
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 192,601, Sep. 30, 1980, abandoned, which is a continuation of Ser. No. 737,219, Nov. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 636,629, Dec. 1, 1975, Pat. No. 4,338,450. This application Apr. 20, 1984, Ser. No. 602,255

Int. Cl.[4] C07C *161/00*; C07D *307/79, 317/64, 333/54*

U.S. Cl. 549—470 **18 Claims**

1. A compound of the formula:



wherein:

R and R′ are the same or different and are alkyl groups having from one to four carbon atoms;

R″ is:

(a) hydrogen; or

(b) alkyl, cycloalkyl, phenyl, phenylalkyl, naphthyl, alkenyloxy, alkynyloxy, phenoxy, napthoxy, 5,6,7,8-tetrahydronaphthoxy, benzofuranoxy, benzothienoxy or methylenedioxyphenoxy, all of which may be unsubstituted or substituted with one or more chloro, bromo, fluoro, cyano, nitro, alkyl, alkynyloxy, phenoxy, phenyl, 2-dithiolanyl, 2-dioxalanyl, alkoxy, haloalkyl, dialkylamino, cyanoalkyl, dicyanoethylidine or alkylthio groups in any combination.

4,595,770

ANTIBIOTIC COMPOUND AND PROCESS FOR RECOVERY THEREOF FROM A FERMENTATION BROTH

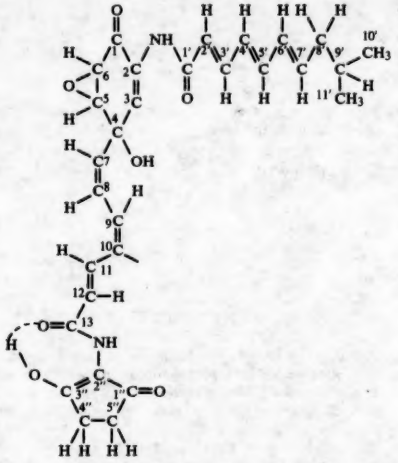
Thomas F. Brodasky, Oshtemo Township, Kalamazoo County, Mich., and David W. Stroman, Bartlesville, Okla., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 21, 1982, Ser. No. 390,093

Int. Cl.[4] C07D *303/48*

U.S. Cl. 549—541 **3 Claims**

1. A compound having the formula



2. A process for recovering antibiotic U-56,407 from a fermentation broth obtained by cultivating *Streptomyces hagronensis* strain 360, having the identifying chracteristics of NRRL 15064, in an aqueous nutrient medium under aerobic conditions until substantial antibiotic U-56,407 activity is imparted to said medium, which comprises:

(a) mixing a chlorinated hydrocarbon solvent with the whole fermentation both;

(b) adding diatomaceous earth to the mixture of whole fermentation broth and chlorinated hydrocarbon solvent, mixing, and filtering to obtain a filtrate and cake;

(c) washing said cake and combining the wash with said filtrate; and

(d) recovering antibiotic U-56,407 from said combined wash and filtrate.

4,595,771

WATER-SOLUBLE ANTIMONY COMPOUNDS AND THEIR PREPARATION

Marilyn W. Blaschke, Pearland; Richard F. Miller, and John Link, both of Humble, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 16, 1984, Ser. No. 672,556

Int. Cl.[4] C07F 9/90

U.S. Cl. 556—77 **9 Claims**

1. A method of preparing water-soluble antimony compounds comprising:

(a) reacting ammonia or an alkylamine with a hydroxycarboxylic acid and

(b) reacting the product of (a) with an antimony oxide at an elevated temperature.

4,595,772

NOVEL WATER-SOLUBLE ANTIMONY COMPOUNDS AND THEIR PREPARATION

Marilyn W. Blaschke, Pearland; Richard F. Miller, and John Link, both of Humble, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 19, 1984, Ser. No. 672,558

Int. Cl.[4] C07F 9/90

U.S. Cl. 556—77 **9 Claims**

1. A method of preparing water-soluble antimony compounds comprising:

(a) reacting an alkanolamine with a hydroxycarboxylic acid and

(b) reacting the product of (a) with an antimony oxide at an elevated temperature.

4,595,773

METHOD FOR PREPARING COPPER-DIAMINE COMPLEXES AND DIAMINES

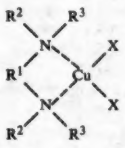
Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 24, 1985, Ser. No. 694,571

Int. Cl.[4] C07F 1/08; C07C 61/12, 61/28, 63/33

U.S. Cl. 556—110 **19 Claims**

1. A method for preparing a copper-diamine complex having the formula



(I)

wherein:

R^1 is an ethylene, trimethylene or C_{5-6} 1,2- or 1,3-cycloalkylene radical which, if substituted, contains only phenyl substituents or tertiary alkyl substituents containing about 4–8 carbon atoms;

R^2 is an alkyl radical containing up to about 8 carbon atoms or a phenyl radical;

R^3 is hydrogen, an alkyl radical containing up to about 8 carbon atoms or a phenyl radical; and

X is chlorine, bromine or iodine;

said method comprising reacting, at a temperature in the range of about 50°–120° C., a dihalide of the formula R^1X_2 with an amine of the formula R^2NHR^3 and at least one basic copper(II) compound in at least one aliphatic or aromatic nitrile as diluent; about 2.1–2.5 moles of amine and an amount of basic copper compound containing 1 gram-atom of copper being used per mole of dihalide.

4,595,774

GASEOUS-SOLID REACTION

Camille Coste, Ceret; Georges Crozat, and Sylvain Mauran, both of Perpignan, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Jun. 13, 1984, Ser. No. 620,069

Claims priority, application France, Jun. 15, 1983, 83 09885

Int. Cl.[4] C07F 3/06; C07C 59/90, 62/32, 65/40

U.S. Cl. 556—118 **19 Claims**

1. In a method of performing a reversible reaction of the gas-solid type which is performed in cycles which are used in chemical energy storage systems or chemical heat pumps, the improvement which comprises adding expanded graphite of a volumetric mass between 0.001 and 0.02 g/cm^3 in the reactive medium in an amount between about 1 and about 60% by weight of the quantity of reactive solid present.

4,595,775

N-METHYLHYDRIDOSILAZANES, POLYMERS THEREOF, METHODS OF MAKING SAME AND SILICON NITRIDES PRODUCED THEREFROM

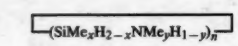
Barry C. Arkles, Bristol, Pa., assignor to Petrarch Systems, Inc., Bristol, Pa.

Filed Apr. 6, 1984, Ser. No. 597,328

Int. Cl.[4] C07F 7/10

U.S. Cl. 556—409 **14 Claims**

1. A cyclic silazane of the formula:



wherein Me represents methyl (CH_3), n=3–6, x=0–1 and y=0.25–1.

4,595,776

SYNTHESIS OF 1α,25-DIHYDROXYERGOCALCIFEROL

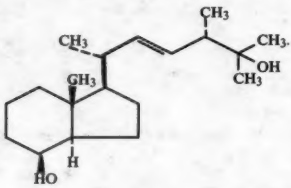
Enrico G. Baggiolini; Andrew D. Batcho, both of North Caldwell; Alfred Boris, Parsippany, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 477,059, Mar. 21, 1983, Pat. No. 4,508,651. This application Dec. 17, 1984, Ser. No. 682,113

Int. Cl.[4] C07F *7/04*; C07C *49/633*

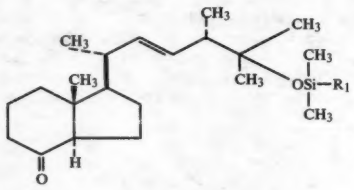
U.S. Cl. 556—436 **4 Claims**

1. The compound, [1R-[(1α(R*),2E,4S*,3aβ,4α,7aα]]-octahydro-1-(5-hydroxy-1,4,5-trimethyl-2-hexenyl)-7a-methyl-1H-inden-4-ol, of the formula



XIV

3. A compound of the formula



II

wherein R_1 is lower alkyl, or phenyl, benzyl, phenylethyl or phenylpropyl which optionally may be substituted by one or more lower alkyl groups.

4,595,777

SILAHYDROCARBONS FROM ALKYLCHLOROSILANES

Kiran R. Bakshi, Murrysville; Anatoli Onopchenko, Monroeville, and Edward T. Sabourin, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

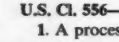
Filed Mar. 4, 1985, Ser. No. 707,881

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—478 **14 Claims**

1. A process for the production of tetra- and trialkylsilanes which comprises reacting

(A) an alkylchlorosilane having the formula



wherein R is an alkyl radical containing from one to three carbon atoms per molecule and x is an integer from 0 to 3, with

(B) a coreactant consisting essentially of a trialkylaluminum compound having the formula

wherein R_1, R_2 and R_3 are the same or different and represent alkyl radicals containing from 6 to 20 carbon atoms per molecule, in a reaction zone, said reaction being conducted under hydrosilylation conditions.

4,595,778

PREPARATION OF METHACRYLIC ACID AND CATALYST THEREFOR

Gerd Duembgen, Dannstadt-Schauernheim; Gerd Fouquet, Neustadt; Richard Krabetz, Kirchheim; Franz Merger, Frankenthal, and Friedbert Nees, Stutensee, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,118

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308625

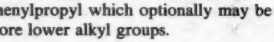
Int. Cl.[4] C07C *51/235, 67/08*

U.S. Cl. 560—208 **10 Claims**

1. In a process for the preparation of methacrylic acid comprising:

(a) reacting methacrolein with a gas mixture containing oxygen and steam, at from 200° to 340° C., over a catalyst which contains molybdenum, tungsten, antimony and phosphorus, and

(b) separating the methacrylic acid from the reaction gases wherein the improvement is that the catalyst of step (a) is an oxidation catalyst of the formula



wherein

X is selected from the group consisting of K, Rb, and Cs,

Y is selected from the group consisting of Nb, Fe, Mn, Sn, Li, Na, Sr, Rh, Ce, Ti and Cr,

a is from about 4.0 to 5.9,

b is from about 0.1 to 2,

c is from about 0.5 to 1.5,

d is from about 0.05 to 0.5,

e is from about 0.01 to 0.5,

f is from about 0.01 to 1.5,

g is from about 0.05 to 1.5, and

h is from about 0 to 0.5.

4,595,779

STABLE LITHIUM DIISOPROPYLAMIDE AND METHOD OF PREPARATION

Robert C. Morrison, Gastonia; Randy W. Hall, Kings Mountain, and Terry L. Rathman, Gastonia, all of N.C., assignors to Lithium Corporation of America, Inc., Bessemer, N.C.

Filed Dec. 24, 1984, Ser. No. 685,318

Int. Cl.[4] C07C *85/26, 87/123*

U.S. Cl. 564—2 **22 Claims**

1. A stable, nonpyrophoric form of lithium diisopropylamide, comprising lithium diisopropylamide in the presence of tetrahydrofuran in an amount not exceeding about 1 mole of tetrahydrofuran per mole of lithium diisopropylamide.

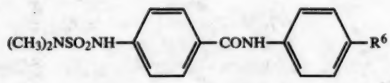
4,595,780

SULFONAMIDO-BENZAMIDE DERIVATIVES

Masaru Ogata; Kosaburo Sato, both of Hyogo, and Takao Konishi, Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jan. 4, 1984, Ser. No. 568,072
Int. Cl.[4] C07C *161/00*
U.S. Cl. 564—79 9 Claims

1. A compound of the formula:



wherein R^6 is a member selected from the group consisting of n-propyl, isopropyl, n-butyl, isobutyl, t-butyl, sec-pentyl, n-hexyl, and bromine.

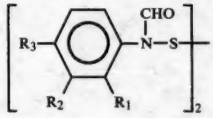
4,595,781

N,N'-DITHIOBISFORMANILIDES AND THEIR USE IN DIENE RUBBER

Eiichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 299,891, Sep. 9, 1981, Pat. No. 4,391,953. This application Mar. 28, 1983, Ser. No. 479,764
Int. Cl.[4] C07C *145/02*
U.S. Cl. 564—102 10 Claims

1. A compound of the formula



wherein R_1, R_2, and R_3 are the same or different substituents selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, chlorine and CF_3.

4,595,782

PROCESS FOR THE PREPRATION OF ALKALI METAL SALTS OF ACYL CYANAMIDES

Christian Hase, Erkrath; Horst Baumann, Leichlingen; Franz-Josef Carduck, Haan, and Hubert Pawelczyk, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 402,251, Jul. 27, 1982, abandoned. This application Nov. 14, 1984, Ser. No. 671,179
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202213
Int. Cl.[4] C07C *125/08*
U.S. Cl. 564—106 15 Claims

1. A process for the preparation of alkali metal salts of acyl cyanamides of aliphatic carboxylic acids which comprises reacting equimolar amounts of a lower alcohol ester of a fatty acid having from 6 to 30 carbon atoms with a mono-alkali metal cyanamide by heating a mixture thereof to temperatures between 100° and 300° C., in the absence of added solvent.

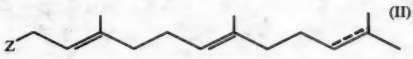
4,595,783

MAGNESIUM CHLORIDE OR PHOSPHONIUM HALIDE DERIVATIVES OF 3,7,11-TRIMETHYL-DODECA-2,6(10)-DIENE(TRIENE)-1-OL

Friedrich Vogel, 35 Oak La., Mountain Lake, N.J. 07026; Joachim Paust, Ringstr. 3, 6708 Neuhofen, and Axel Nuerrenbach, Koenigsberger Str. 7, 6718 Gruenstadt, both of Fed. Rep. of Germany

Division of Ser. No. 508,802, Jun. 28, 1983, Pat. No. 4,544,758. This application Aug. 31, 1984, Ser. No. 646,271
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224108
Int. Cl.[4] C07F *9/54, 3/02*
U.S. Cl. 568—9 2 Claims

1. A compound having the general formula II



(II)

wherein the dotted line indicates that the compound may have an additional double bond at the 11 position, and in which Z is one of the groups

ClMg—; BrMg— (IIa)

$Cl^{\ominus}(C_6H_5)_3P—^{\oplus}$; or $Br^{\ominus}(C_6H_5)_3P—^{\oplus}$ (IIb)

4,595,784

HYDROCARBON FUEL ADDITIVES AND METHOD FOR PREPARING SAME

G. David Mendenhall, Hancock, and Hsiang T. Chen, Houghton, both of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Nov. 7, 1984, Ser. No. 669,096
Int. Cl.[4] C07C *45/00*
U.S. Cl. 568—387 9 Claims

1. A method for preparing a compound having the general formula:

$$R_xCOH[COR]_y$$

wherein
R is a lower alkyl hydrocarbon radical,
y is 0 or 1, and
x is 2 when y is 1 and 3 when y is 0.

said method comprising admixing carbon monoxide, a transition metal halide, and an organomonolithium compound having the general formula RLi or an anionic equivalent thereof, wherein R is the same as above, and recovering said compound from the resulting reaction product.

4,595,785

PREPARATION OF DIMETHYL ETHER BY CATALYTIC DEHYDRATION OF METHANOL

Loren D. Brake, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 505,356, Jun. 16, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 707,606
Int. Cl.[4] C07C *41/09*
U.S. Cl. 568—698 3 Claims

1. In the preparation of dimethyl ether by the catalytic dehydration of methanol, the improvement which comprises using as the catalyst an aluminotitanate which contains, by weight, 0.1–20% of titania and 80–99.9% of alumina.

4,595,786

HYDRATION OF CYCLOHEXENE IN PRESENCE OF PERFLUOROSULFONIC ACID POLYMER

Francis J. Waller, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 27, 1984, Ser. No. 675,429

Int. Cl.[4] C07C *35/08*

U.S. Cl. 568—835 10 Claims

1. In a method for hydrating a C_2 to C_6 olefin to the corresponding alcohol bv reacting the olefin with water in the presence of a perfluorosulfonic acid polymer catalyst, the improvement which consists essentially of employing:

(i) cyclohexene as the olefin reactant in a liquid phase process;

(ii) a reaction temperature of about 175° to 185° C.;

(iii) a water to cylcohexene ratio of about 1:1 to 2.5:1; and

(iv) a hold-up time of about 20 to 30 minutes;

the method further characterized by producing cyclohexanol at a conversion above 4% and a selectivity above 80%.

4,595,787

POTASSIUM CARBONATE SUPPORTS, CATALYSTS AND OLEFIN DIMERIZATION PROCESSES THEREWITH

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 24, 1985, Ser. No. 747,747

Int. Cl.[4] C10C *2/24*

U.S. Cl. 585—516 6 Claims

1. A process for the dimerization of at least one dimerizable olefin which comprises contacting at least one dimerizable olefin under dimerization conditions with a catalyst consisting essentially of:

(i) 0.1 to 20 wt.% of at least one elemental alkali metal deposited on a

(ii) potassium carbonate support containing 0.09 to 9 wt % of at least one carbonaceous compound and having a minimum particle size of about 300 microns and a crush strength of at least about 5 pounds; wherein the concentration of said carbonaceous compound is substantially less at the surface of said support than in the interior portions thereof.

4,595,788

PROCESS FOR PRODUCING BUTADIENE

Haruhisa Yamamoto, Yokosuka, and Kin-ichi Okumura, Takaoka, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,786

Claims priority, application Japan, Nov. 25, 1983, 58-221633; Dec. 14, 1983, 58-234306

Int. Cl.[4] C07C *5/09*

U.S. Cl. 585—621 9 Claims

1. A process for producing butadiene which comprises (1) a reaction step of forming butadiene by gas-phase catalytic oxidative dehydrogenation of n-butene using as a reaction diluent gas a gas mixture which contains at least 30% by volume of an off-gas, (2) a cooling step of cooling the resulting gas discharged from the reaction step (1) to remove trace amounts of high boiling by-products contained in the resulting gas, (3) an aldehyde removal step of removing small amounts of aldehydes contained in the cooled gas discharged from the cooling step (2), (4) a compression step of compressing the gas discharged from the aldehyde removal step (3), and (5) a C_4 component recovery step of recovering a C_4 component containing butadiene and other C_4 hydrocarbons from the compressed gas discharged from the compression step (4).

4,595,789

SOLAR CELL ASSEMBLY

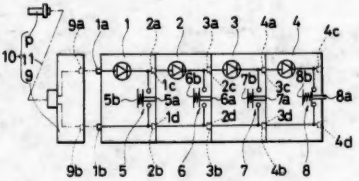
Eiichi Nagase, Chiba, and Shinichiro Watari, Shiga, both of Japan, assignors to Kyocera Corporation, Japan

Filed Apr. 27, 1984, Ser. No. 604,915

Claims priority, application Japan, Apr. 30, 1983, 58-065186[U]; Jul. 25, 1983, 58-116223[U]

Int. Cl.[4] H01L *25/02*

U.S. Cl. 136—244 8 Claims



1. A solar cell assembly comprising first and second modules, each module comprising a solar cell, a pair of input terminals for series connection, a pair of output terminals for series connection provided on two sides of said module, a pair of input and output lines for series connection, by which lines said input and output terminals for series connection are connected to each other and said solar cell is connected to at least one of said lines, a pair of input terminals for parallel connection and a pair of output terminals for parallel connection provided on the other two sides of said module, and a pair of input and output lines for parallel connection, by which lines said input and output terminals for parallel connection are connected to each other and said pair of input and output lines for parallel connection are connected across said solar cell which is connected to said input or output line for series connection, said assembly further comprising a normally-on switch having means for turning the switch off when said input terminals for series connection of said first module are connected to said output terminals for series connection of said second module, said normally-on switch being connected across the output lines for series connection and opening when said input terminals for series connection of said first module are connected to said output terminals for series connection of said second module.

4,595,790

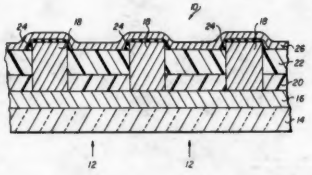
METHOD OF MAKING CURRENT COLLECTOR GRID AND MATERIALS THEREFOR

Bulent M. Basol, Los Angeles, Calif., assignor to Sohio Commercial Development Co., Cleveland, Ohio and BP Photovoltaics, Ltd., London, England

Filed Dec. 28, 1984, Ser. No. 687,079

Int. Cl.[4] H01L *31/06, 31/18*

U.S. Cl. 136—256 23 Claims



1. A thin-film photovoltaic device comprising an optically transparent, electrically conductive substrate; a first semiconductor layer formed on the conductive transparent substrate, a second semiconductor layer of opposite conductivity type than the first semiconductor layer deposited contiguously onto the first semiconductor layer and forming a junction therewith; a conductive film disposed over the second semiconductor layer to form a back electrical contact; and a current collector grid in contact with the first semiconductor layer and extending through at least the first semiconductor layer, the current collector grid being in electrically blocking contact with the second semiconductor layer; the grid being in ohmic contact with the first semiconductor layer and the back electrical contact being in ohmic contact with the second semiconductor layer.

4,595,791

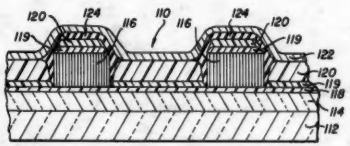
THIN-FILM PHOTOVOLTAIC DEVICES INCORPORATING CURRENT COLLECTOR GRID AND METHOD OF MAKING

Bulent M. Basol, Los Angeles; Eric S. Tseng, Torrance, both of Calif., and William J. Biter, Hudson, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 29, 1985, Ser. No. 696,149

Int. Cl.[4] H01L *31/06, 31/18*

U.S. Cl. 136—256 29 Claims



1. A photovoltaic device comprising a first semiconductor layer of one conductivity type, a second semiconductor layer having the same type conductivity type as the first semiconductor layer, and a third semiconductor layer having a conductivity type opposite the conductivity type of the first and second semiconductor layers and forming a junction with the second layer, a front contact current collector grid being disposed between the first semiconductor layer and the second semiconductor layer.

4,595,792

METHOD FOR DETECTING FAULTS IN A SYNTHETIC ELECTRO-MECHANICAL CABLE

Richard C. Swenson, Carriere, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

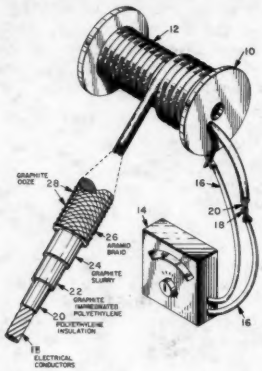
Filed Apr. 1, 1983, Ser. No. 481,521

Int. Cl.[4] H01B *7/32, 9/02*

U.S. Cl. 174—102 SC 2 Claims

1. An improved synthetic electro-mechanical cable which provides means for detecting faults by subsequent meggering of the type having an electrical conductor, an insulation layer and a braided outer reinforcement layer of synthetic fiber, the improvement comprising an electrically conductive, graphite impregnated polyethylene layer disposed on and surrounding said insulation layer and a slurry layer of conductive material between said conductive graphite impregnated polyethylene layer and said reinforcement layer, said slurry layer of conductive material impregnating and oozing through said reinforcement layer so as to provide good electrical contact with a

metal reel when wound thereon and thus to provide an electrical path between the surface of said reinforcement layer and



said electrical conductor should there be a break in said insulation layer.

4,595,793

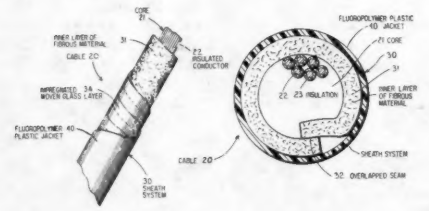
FLAME-RESISTANT PLENUM CABLE AND METHODS OF MAKING

Candido J. Arroyo, Lilburn, and Palmer D. Thomas, Tucker, both of Ga., assignors to AT&T Technologies, Inc., Berkely Hgts. and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Continuation-in-part of Ser. No. 518,582, Jul. 29, 1983, abandoned. This application Oct. 18, 1984, Ser. No. 661,889

Int. Cl.[4] H01B *7/02*

U.S. Cl. 174—121 A **17 Claims**



1. A cable which resists flame spread and smoke evolution, said cable comprising:

a core which includes at least one conductor enclosed in a plastic coating; and

a sheath system which encloses said core and which has a thermal conductivity in the range of about 0.0001 to 0.001 cal. cm/cm^{2}sec°C., said sheath system being effective to provide a predetermined time delay prior to thermal decomposition of the conductor coating when the cable is subjected to a relatively high temperature and including:

a layer of an aramid fibrous material which encloses said core, said fibrous material having a relatively low air permeability, a relatively low heat absorptivity, and a theral conductivity of about 0.00024 cal. cm/cm^{2}sec°C.; and

an extruded jacket of a fluoropolymer plastic material which encloses said layer of fibrous material.

15. A method of making a fire retardant plenum cable, said method comprising the steps of;

advancing a conductor which is enclosed in a plastic coating along a path of travel;

wrapping a strip of an aramid fibrous material which has a relatively high compressibility, a relatively low air permeability, and a relatively low heat absorptivity about said conductor;

wrapping a strip of woven glass material which has been impregnated with a fluorocarbon resin about said strip of aramid fibrous material; and

extruding a layer of fluoropolymer plastic material about said strip of woven glass material.

4,595,794

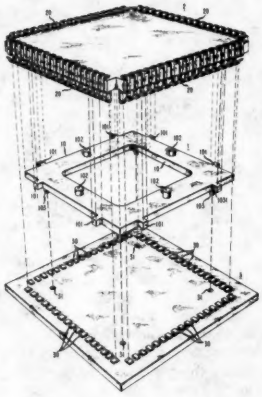
COMPONENT MOUNTING APPARATUS

Norman Wasserman, Columbus, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 19, 1984, Ser. No. 591,312

Int. Cl.[4] H05K *7/12, 1/18*

U.S. Cl. 174—138 G **10 Claims**



1. Apparatus for positioning a component on a circuit board comprising a generally rectangular insulating member having index projections extending horizontally outward from each outer edge thereof for insertion between adjacent terminals of the component and registration pins projecting from the bottom of said insulating member for insertion into holes of the circuit board and enabling said index projections to align and engage said component terminals with printed wiring circuitry of the circuit board and further having projections extending vertically from an upper surface thereof for maintaining the component in a spaced apart relationship with respect to said insulating member and wherein said registration pins each have a shoulder portion for maintaining said insulating member in a spaced apart relationship with respect to the circuit board with said component terminals in contact with the circuit board.

4,595,795

AUTOMATIC SENSITIVITY SWITCHING CIRCUIT FOR A CORDLESS TELEPHONE

Hiroshi Endo, Ichikawa, Japan, assignor to Uniden Corporation, Ichikawa, Japan

Filed Jul. 18, 1984, Ser. No. 631,902

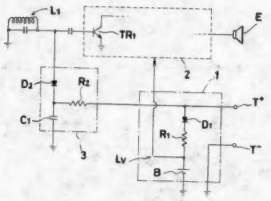
Claims priority, application Japan, Sep. 2, 1983, 58-160497

Int. Cl.[4] H04M *1/02*

U.S. Cl. 179—2 EA **6 Claims**

1. An automatic sensitivity switching circuit for use in a cordless telephone comprising a base unit and a portable handset in wireless connection with the base unit, said portable handset including a charging circuit which has a secondary battery, and is responsive to the placement of the handset on the base unit for charging the secondary battery, a call signal amplifying circuit which is adapted to receive signals from the

base unit by means of an antenna and supplied with electric power from the secondary battery in said charging circuit, which automatic sensitivity switching circuit comprises a



switching element for turning itself on in response to a charging current fed from the base unit to the secondary battery of the handset so as to substantially lower the sensitivity of the call signal amplifying circuit.

4,595,796

METHOD OF AND A CIRCUIT ARRANGEMENT FOR DETERMINING CURRENT CRITERIA IN THE LINES OF A TELEPHONE SYSTEM

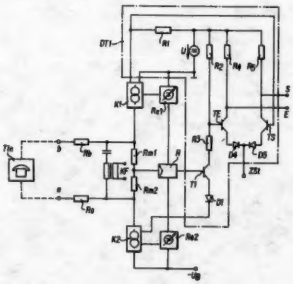
Jörg Robra, Heroldsberg, and Hans Göschin, Nuremberg, both of Fed. Rep. of Germany, assignors to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremburg, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,964

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141375

Int. Cl.[4] H04M *1/76*

U.S. Cl. 179—18 FA **12 Claims**



1. A method of determining current criteria in a subscriber's two wire circuit of a telephone system in which a subscriber's station is connected at one end of two wires and a symmetrical voltage divider is connected at the other end of the two wires, two separate constant current sources being connected to respective connection points of the voltage divider with the wires, each constant current source being adjustable by a reference voltage so as to keep constant current in the circuit irrespective of the length of the wires, comprising the steps of measuring current flowing through individual wires of the circuit and, in the case of a difference between the measured currents, then adjusting by means of a symmetry regulating device the reference voltage for at least one constant current source, to a value at which current flowing through the circuit is limited to a maximum value and the regulating device is blocked and, at the same time, detecting and evaluating signals delivered by the regulating device during the adjusting step to determine from said signals the condition of the subscriber's circuit, and further comprising the step of connecting into the subscriber's circuit a device for simulating the subscriber's station, then introducing into the simulating device voltage signals corresponding to depression of the ground button of the subscriber's station or a short-circuit to ground of a branch of the subscriber's circuit and testing and evaluating the condition of the circuit by the voltage signals.

4,595,797

RINGING SIGNAL GENERATOR FOR A SUBSCRIBER TELEPHONE SET

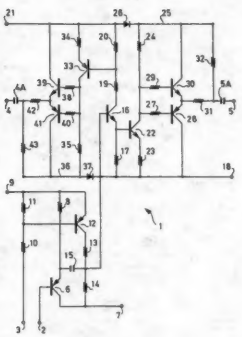
Bernard Gilles, Cergy; Raphaël Roux, Argenteuil, and José Paulet, Courbevoie, all of France, assignors to Thomson-CSF Telephone, Colombes, France

Filed Jul. 19, 1984, Ser. No. 632,464

Claims priority, application France, Jul. 22, 1983, 83 12174

Int. Cl.[4] H04M *3/22*

U.S. Cl. 179—84 A **3 Claims**



1. A ringing signal generating circuit for a subscriber telephone set, comprising:

an enabling circuit including a switching transistor connected to a logic control input for connecting a ringing signal;

a phase shifting circuit, including a phase shifting transistor, connected to the output of said enabling circuit, which produces two outputs which are phase shifted by 180°;

driving means including two drivers, each of which receives one of the outputs of said phase shifting circuit;

amplifying means including two amplifying circuits, each receiving an output from a corresponding driver, said amplifying circuit having a very high output impedance at rest;

output means including two galvanic isolating capacitors, each connecting the output of an amplifying circuit to a line wire; and

impedance means including two impedance circuits, where each impedance circuit includes a resistor and a diode connected between a terminal of a supply source and the junction between a corresponding amplifier output and said galvanic isolating capacitor.

4,595,798

TELEPHONE NUMBER INPUT TERMINAL DEVICES

Robert M. Brodbeck, Littleton, Colo., assignor to Marcamor, Inc., Denver, Colo.

Filed Jan. 18, 1984, Ser. No. 571,789

Int. Cl.[4] H01M *1/274*

U.S. Cl. 179—90 BD **11 Claims**

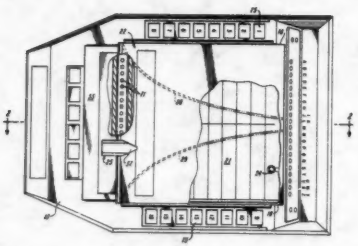
1. In a telephone number input terminal device for memory stored dialing data for automatic telephone dialing, the combination comprising:

a divided housing including an upper section and a base section removable from said upper section;

multiple card index means in said housing including a plural-

ity of cards one on another for visual listing of names and telephone numbers, each card including individual lines for individual names and telephone numbers, a cover positioned over said cards, and finding means including a hand-actuated finder movable along said cover for positioning an individual card for visual display of the card's content, said cover having an enlarged front end portion and said finder having a C-shaped recess to receive said enlarged end portion to slidably move on and be retained by said enlarged end position, said finder being guided for movement in a recessed area of said upper section and held at selected positions for each dard;

card switch means activated by positioning said finding means, said card switch means including a first electric element corresponding to each card, each said first electric element being a light emitting device that is successively turned on and off by a control device, said electric elements being disposed atspaced intervals across the housing and being mounted on a printed circuit board supported in said upper section, said printed circuit board being insertable into and removable from said upper section, and a second electric element operatively interactive



with each said first electric element when substantially aligned therewith, said second electric element being carried by said finder, said second electric element being a light sensing device that transmits an output to said control device when opposite an illuninated light emitting device, said car switch means intitally latching onto a memory block of data representing an individual card when said cover is closed, said latching being completed via said card switch means when the cover is closed whereby, with a first card selection and with said cover closed, the latching for the first card selected remains in effect until said finder is moved to a second card selection and said cover is closed; and

selector switch means including a number of push buttons equal to the number of lines on one of said cards, one of said push buttons associated with each of said lines, each said push button connected in a second circuit corresponding to a particular line and a particular selected card which, upon activation of a selected push button, is effective to retrieve and automatically dial a telephone number stored at a location in a memory corresponding with the telephone number of the particular line that has been selected.

4,595,799

MODULARIZED 66-BLOCK

Dennis J. Krob, Woodridge; Edward Cieniawa, Clarendon Hills, both of Ill., and Francesio Liburdi, Endicott, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 16, 1982, Ser. No. 349,123

Int. Cl.[3] **H04Q** *1/02, 1/18;* **H04M** *9/00*

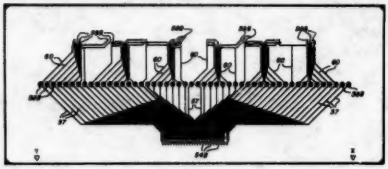
U.S. Cl. 179—98 **11 Claims**

1. A termination module for interconnecting telephone lines with individual telephone instruments equipped with modular plug terminations comprising:

a printed circuit board;

a multi-contact connector mounted on said printed circuit board including a plurality of contacts for termination to said telephone lines;

a plurality of modular jacks mounted on said printed circuit board for receiving any of the modular plugs on the individual telephone instruments and;



means on said printed circuit board including circuit foil paths electrically interconnecting the contacts of said multi-contact connector with those of said modular jacks to uniquely associate a given set of said contacts with an individual one of said jacks, whereby the need for patch-cords for cross-connection between a specific telephone line and a specific telephone instrument is eliminated.

4,595,800

KEY TELEPHONE SYSTEM

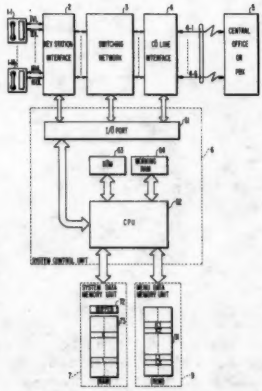
Kazuyuki Nagatomi, and Rikio Sato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,414

Claims priority, application Japan, Sep. 20, 1983, 58-173492

Int. Cl.[4] **H04M** *3/00*

U.S. Cl. 179—99 R **1 Claim**



1. A key telephone system including a plurality of key telephone stations of a first type, a switching network for connecting said key telephone stations to CO/PBX or intercom telephone lines, and system control means for controlling said key telephone stations and said switching network in accordance with system data stored in system data memory means, and further including a key telephone station of a second type operable in a first mode as a key telephone station of the first type and in a second mode as an input means for setting system data in said system data memory means, and menu memory means in which are stored in advance a plurality of combinations of system data, prepared for each kind of service, wherein said system control means effects control, on the basis of system data selected to control operation of the key telephone stations as key telephone stations of the first type, by loading

said system data memory means with system data selected from said menu memory means by push-button operation of said key telephone station of the second type in said system data setting mode;

wherein said key telephone station of the second type includes function buttons generating function codes and dial buttons generating numerical codes; said system control means includes a mode memory section for designating either said first mode or said second mode, and a menu number memory section, responsive to said dial buttons for designating a menu number, the contents of which re to be written into the system data memory means; said menu memory means including a read only memory array, a data read port, and an address selector responsive to the menu number stored in said menu number memory section and;

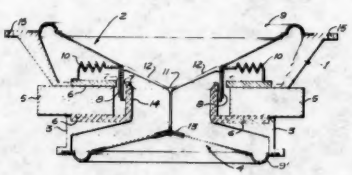
wherein said system data memory includes a random access memory array, an address selector responsive to address information from a selected menu address for addressing areas in said random access memory array, a data read/write port, a buffer memory storing data from the selected menu address, gate means responsive to a function button of said key telephone station of the second type for selectively passing data stored in said buffer means to said data read/write port, whereby data from the selected menu address is written into the random access memory array at the address designated by said system data address selector in response to address information received from the selected menu address.

4,595,801

COUPLED DUAL CONE VELOCITY DRIVER SPEAKER

Ronald Coffin, 27 Abbott St., Marblehead, Mass. 01945

Filed Oct. 27, 1983, Ser. No. 546,180
Int. Cl.⁴ H04R *1/32*
U.S. Cl. 179—115.5 PS **1 Claim**



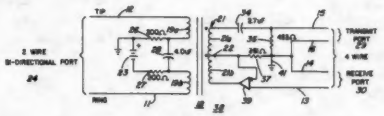
1. A coupled dual cone velocity driver speaker which is an improved acoustical transducer having a frame, a sub-frame, a permanent magnet, an inner magnetic pole piece, an outer magnetic pole piece, a voice coil, a primary and a secondary cone, with the primary and secondary cones being mounted to the frame and sub-frame respectively by a resilient suspension wherein the improvement comprises the pneumatic coupling of said primary and secondary cones by an orifice in the center of said primary cone and said inner magnetic pole piece and the mechanical coupling of said primary and secondary cones by a rigid coupling device so that when said voice coil is energized with electrical current within the field of said magnet, the resulting force causes both the primary and secondary cones to move in unison causing sound waves from the secondary cone to travel through the orifice joining with and radiating in the same direction as sound waves from the primary cone.

4,595,802

HYBRID CIRCUIT

John P. Wittman, Raleigh, N.C., assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 29, 1983, Ser. No. 555,971
Int. Cl.⁴ H04B *1/58*
U.S. Cl. 179—170 D **9 Claims**



1. A hybrid circuit for interfacing a two-wire bidirectional line and a pair of two-wire unidirectional lines, said hybrid circuit comprising:

a transformer having a first primary winding, a second primary winding and a center tapped secondary winding;

said first primary winding having a first end connected to a first wire of the two wire bidirectional line and a second end connected to a capacitance means;

said second primary winding having a first end connected to said capacitance means and a second end connected to a second wire of the two wire bidirectional line;

said first and second primary windings being interconnected in a voltage aiding serial relationship, by said capacitance means;

an operational amplifier having a first input responsive to the signal appearing on a first one of said unidirectional lines, having a second input responsive to the signal appearing at said center tap of said secondary winding, and having an output connected directly to the first end of said secondary winding;

a balancing network connected between said center tap and ground;

a matching network connected between a second end of the secondary winding and ground for matching the impedance of said hybrid circuit to the impedance of said two wire bidirectional line; and

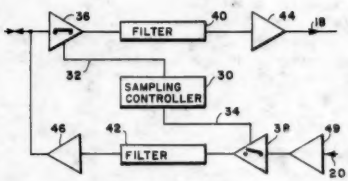
the second one of said unidirectional lines being responsive to the signal on the second end of said secondary winding.

4,595,803

BIDIRECTIONAL AMPLIFIER

James T. Wright, Cedarcrest, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 2, 1984, Ser. No. 576,500
Int. Cl.⁴ H04B *1/58*; H04M *1/20*
U.S. Cl. 179—170.6 **16 Claims**



1. A bidirectional amplifier for passing first signals from a first source circuit to a destination circuit and second signals from a second source circuit to said first source circuit comprising:

first switchable signal path means, connected between said first source circuit and said destination circuit, for passing

either only said first signals while closed or no signal while open;

second switchable signal path means, connected between said second source circuit and said first source circuit, for passing either only said second signals while closed or no signal while open; and

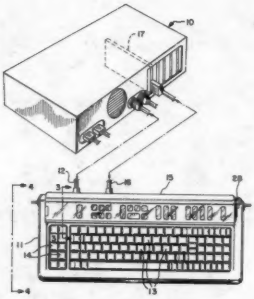
switching signal generating means, connected to said first and second switchable signal path means, for causing alternately, at a frequency at least twice the highest frequency of said first and second signals, only either one of said switchable signal path means to be open and the other of said switchable signal path means to be closed, or the other of said switchable signal path means to be open and the one of said switchable signal path means to be closed.

4,595,804

AUXILIARY KEYBOARD

Robert N. MacConnell, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 8, 1985, Ser. No. 721,010
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—5 A **6 Claims**



1. For a computer system comprising a stand-alone keyboard having a series of keys mounted upon a face plate in such a manner as to leave a substantial margin adjacent at least one edge thereof: an auxiliary keyboard comprising a generally U-shaped support structure for clamping around said edge and over said margin, a series of keys mounted on said support structure in the portion thereof which overlies said margin when the auxiliary keyboard is so clamped, and electrical cable means supported by said support structure and electrically connected to said keys.

4,595,805

SWITCH STRUCTURE COMPRISING RECESSED CONTACTS

Toru Masuda, Higashi-Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

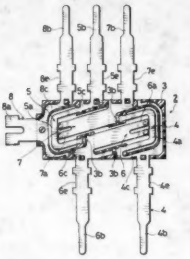
Filed Sep. 21, 1984, Ser. No. 653,106
Claims priority, application Japan, Sep. 30, 1983, 58-183895; Sep. 30, 1983, 58-153211[U]
Int. Cl.[4] H01H *13/10*
U.S. Cl. 200—6 R **10 Claims**

1. A switch structure wherein contacts are recessed to be held, and comprising,

at least one metallic stationary contact,

at least one metallic movable contact, each stationary contact being associated with a movable contact, and

a contact holding member of electrical insulating material for holding the stationary and movable contacts, in which each contact includes a recessed part held by the holding member, a further part to be bent relative to said recessed part, wherein the further part of each stationary contact and its associated movable contact define contact areas to perform a relative contacting and separating operation, and wherein each contact is arranged not to overlap one another when each contact is viewed in development in the same plane.

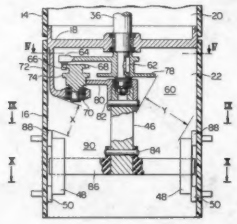


4,595,806

ON-LOAD TAP CHANGER

Katsuaki Itoh, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1984, Ser. No. 679,294
Claims priority, application Japan, Dec. 8, 1983, 58-232979
Int. Cl.[4] H01H *3/44, 19/54*
U.S. Cl. 200—11 TC **4 Claims**



1. A selector switch type on-load tap changer having a central axis, comprising:

an axially extending rotary selector switch operable as a diverter, including a plurality of selector contacts which are divided according to phases into selector groups which are arranged in the axial direction of the tap changer;

a rotary change-over switch axially spaced from said selector switch, including a plurality of fixed change-over contacts which are divided into change-over groups corresponding to respective ones of said phases, which are arranged about said axis in corresponding angular segments about said axis in the circumferential direction of the tap changer; and

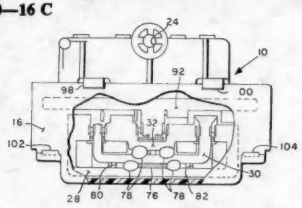
means, including an intermittent drive mechanism disposed along said axis so as to be closer to one of said selector groups than to any of the others of said selector groups and so as to have the same electrical potential as one of the selector contacts of said one of said selector groups, for intermittently trasmitting the rotary motion of said change-over switch to said selector switch, said intermittent drive mechanism having a shape which is asymmetrical with respective to said axis so as to have a closest portion that is located closer to the one of said change-over groups corresponding to the same phase as the phase to which said one of said selector groups corresponds, than to the others of said change-over groups, and that is located in the angular segment corresponding to said one of said change-over groups.

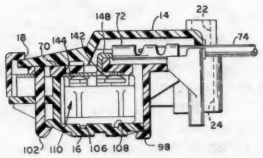
4,595,807

SLIDE SWITCH

Dennis DeVera, Mundelein, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 547,560, Oct. 31, 1983, Pat. No. 4,536,953.
This application Apr. 25, 1985, Ser. No. 712,372
Int. Cl.[4] H01H *15/04*
U.S. Cl. 200—16 C **1 Claim**





1. A sliding type electrical switch assembly comprising:

(a) housing means defining a switching cavity;

(b) a stationary elongated contact strip formed of electrically conductive material disposed in said cavity and retained therein;

(c) a contact plate formed of electrically conductive material, said plate retained on said housing spaded closely adjacent said stationary contact strip, said plate defining a plurality of generally U-shaped contact portions disposed in nested arrangement with the legs of said U-shape disposed in spaced parallel arrangement at plural stations along the direction of elongation of said stationary contact strip, said U-shaped portions formed in said plate with frangible interconnections removed after said plate is retained in said housing such that after removal of said frangible portions, each of said U-shaped contact portions forming discrete electrically isolated U-shaped contacts, and

(d) switching means received in said switching cavity and slidably moveable therein in the direction of elongation of said stationary contact strip, said switching means continuously contacting said stationary contact strip and operable upon sliding movement to make and break a circuit between said stationary contact strip and one of the leg portions of each of said U-shaped contacts.

4,595,808

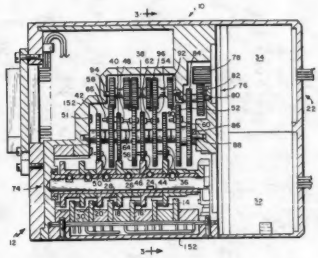
ELECTROMECHANICAL SWITCH

Anthony P. Antonuzzi, Stoneham, and Donald J. Carignan, Chelmsford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 6, 1984, Ser. No. 647,781
Int. Cl.[4] H01H *43/60*; F42C *15/40*
U.S. Cl. 200—37 R **8 Claims**

1. An electromechanical switch havinga hardened memory, said memory having a selectable multi-digit number of a given counting base stored therein, said switch electrically closing when a plurality of sequential switches close simultaneously after a predetermined length of time based upon said number stored therein, said electromechanical switch comprising:

counter means for producing a combination of unique electrical outputs, each of said outputs of said combination having a plurality of electrical pick-off positions, each output having one electrical pick-off, said electrical pick-off being brush means for transferring electrical signals, the number of said pick-off positions per output being equal to said given counting base used by said counter means, one of said positions per output being a selectable reference position, the number of unique electrical outputs in said combination being defined by B^N where B is said counting base and N is the number of said outputs, said counter means sequencing through said combination, said counter means further comprising a mechanical counter having a plurality of stages, each of said stages having a counter wheel geared thereto, each of said counter wheels being co-axial, each of said counter wheels rotating in angular steps whereby the number of steps per rotation of said counter wheel in each of said stages is equal to said counting base, geneva means actuated by a motor drive to rotate said counter wheels, each of said counter wheels having fixedly attached about a circumference said electrical pick-off, a pick-off of a first stage of said plurality of stages electrically contacting an input trigger circuit being a first circuit of said electrical means, and a pick-off of a last stage of said plurality of stages being in intermittent electrical contact with said memory means;



memory means for holding one unique combination of electrical outputs, each of said outputs having an electrical contact fixed in one preselected position being one of a plurality of positions available, said memory means having a number of outputs at least equal to the number of outputs from said counter means, said plurality of positions available being equal to said counting base of said counter means, said one preselected position corresponding to one digit of said multi-digit number stored in said memory means, said plurality of sequential switches being at least equal to said number of outputs of said counter means, each sequential switch electrically closing when corresponding outputs of said counter means and said memory have said pick-off and said contact in electrical continuity as defined by said selectable reference position of said counter means and said preselected position of said memory means, said electromechanical switch producing an electrical output signal if and only if all of said sequential switches are in electrical continuity simultaneously;

said memory means further comprising:

set/lock means for loading and holding said multi-digit number into said memory means;

a stepper motor for actuating said set/lock means in response to signals received from said electrical means, said stepper motor being rotatable in both directions;

a plurality of set disks connected to said set/lock means, each of said set disks being independently rotatable and co-axially located on said set/lock means;

a plurality of counter set disks, each of said counter set

disks being geared to said set disks and co-axially located, each of said counter set disks having fixedly located about a circumference an electrical contact, said counter set disks being co-axially located with said counter wheels of said counter means, the number of said counter set disks being equal to the number of said counter wheels, said counter set disks being alternately located between said counter wheels, each of said counter set disks being in continuous electrical contact with one of two of said adjacent counter wheels excepting a last counter set disk which is in continuous electrical contact with a second circuit of said electrical means, said last counter set disk being adjacent said pick-off of said last stage of said counter means, each of said counter set disks having fixedly located thereon an electrical contact, said electrical contact being intermittently in electrical contact with the other of two of said adjacent counter wheels, and

reading means for reading digital data stored on said set disks, said digital data being communicated to a computer that controls the movement of said stepper motor through said electrical means, said stepper motor controlling said set/lock means;

a housing for holding said counter means and said memory means;

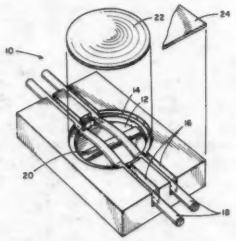
electrical means for controlling said counter means and said memory means.

4,595,809

SNAP ACTION DOME SWITCH HAVING WIRE CONTACTS

L. Franklin Pool, Vancouver, Wash., assignor to Dart Industries, Inc., Northbrook, Ill.

Filed Aug. 17, 1984, Ser. No. 641,894
Int. Cl.[4] H01H *13/52*
U.S. Cl. 200—76 **5 Claims**



1. A tactilely precise switch comprising:

(a) a case, defining a cylindrical cavity therein, said cavity including a larger diameter counterbore having a lower lip which is located above the bottom of said cavity;

(b) a plurality of conductors;

(c) means associated with said case for press-fit positioning each of said conductors transversely across and through said cavity such that the top surfaces of the conductors are beneath said counterbore proximate the perimeter of said cavity;

(d) bridge means for raising said conductors in the medial portion of said cavity such that the top surfaces thereof are generally co-planar with said lip of said counterbore;

(e) an electrically conductive deformable dome having a diameter which is approximately equal to the diameter of said counterbore; and

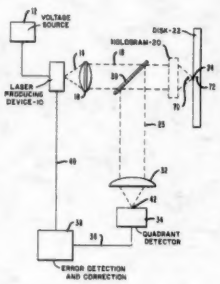
(f) means for securing said dome in said cavity with its concave side facing said conductors.

4,595,810

DEVICE FOR FOCUSING A LASER ON A RECORDING MEDIUM BY WAVELENGTH MODULATION

Ronald L. Barnes, Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 18, 1984, Ser. No. 571,886
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **7 Claims**



1. A focusing apparatus for focusing a radiant beam on a desired plane comprising:

a radiation source for providing a radiation beam of controllable wavelength;

a hologram intercepting said radiation beam at a fixed distance from the desired plane, for focusing said radiation beam as a function of the wavelength of said radiation beam; and

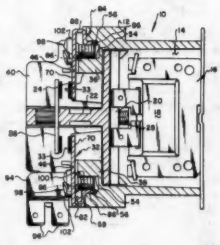
controlling means coupled to said radiation source for controlling the wavelength of said radiation beam so as to focus said beam on a desired plane.

4,595,811

SWITCH CONTACT ELEMENT RETAINING MEANS AND METHOD OF ASSEMBLY

Warren A. Lofstrand, Enfield, Conn., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 29, 1985, Ser. No. 770,812
Int. Cl.[4] H01H *1/58*
U.S. Cl. 200—284 **12 Claims**



1. An electrical contactor device having a base member including means forming a support surface thereon and a bore extending generally normal to said support surface, a longitudinal keyway opening into said bore and extending longitudinally thereof from said support surface, a contact element comprising a relatively flat plate portion and a first projection extending from said plate portion and being bendable relative to said plate portion, means defining and opening in said plate portion and located thereon in such a way that at least a portion of said first projection extends at least partially across said opening, said first projection being displaceable into said key-

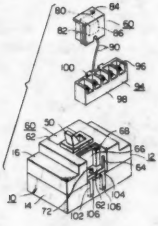
way be means extending through said opening for securing said contact element to said base member.

4,595,812

CIRCUIT INTERRUPTER WITH DETACHABLE OPTIONAL ACCESSORIES

Shigemi Tamaru, and Kiyomi Yamamoto, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 20, 1984, Ser. No. 652,627
Claims priority, application Japan, Sep. 21, 1983, 58-175896
Int. Cl.[4] H01H *45/02, 45/08*
U.S. Cl. 200—307 **10 Claims**



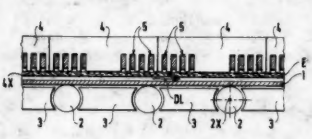
1. A circuit interrupter comprising:
a housing including a housing wall;
an interrupting mechanism disposed within said housing and including a pair of separable contacts and an operating mechanism for opening and closing said separable contacts;
a first optional accessory unit used in connection with an opening operation of said interrupting mechanism, which said first optional accessory unit includes a movable member operable in connection with the opening operation of said interrupting mechanism;
fastening means for detachably fastening said first optional accessory unit to an outer surface of said housing wall of said housing; and
connecting means comprising an operating rod movably extending through said housing wall for mechanically connecting said movable member of said first optional accessory unit and said interrupting mechanism.

4,595,813

INDUCTION HEATING APPARATUS FOR MOVING METAL PRODUCTS

Bernard Chaussé, Antony; Jean Hellegouarc'h, Le Perreux sur Marne, and Jean Maurice, Paris, all of France, assignors to CEM - Compagnie Electro-Mecanique, Paris, France

Filed Jun. 13, 1984, Ser. No. 620,210
Claims priority, application France, Jun. 13, 1983, 83 09723
Int. Cl.[4] H05B *5/00, 6/64*
U.S. Cl. 219—10.71 **6 Claims**



1. Induction heating apparatus for moving metal products, including:
conveyance rollers (2) for bearing and carrying along the products to be heated (1) in a longitudinal horizontal direction (DL); said rollers being one after the other and mounted for rotation around shafts (2X) which are parallel to a transverse direction, perpendicular to said longitudinal direction; said shafts being supported by end bearings,
induction coils (5) supplied with electric current for generating a periodically variable magnetic flux,
a looped magnetic circuit comprising a top section (4) of high magnetic conductivity elements and a spaced, bottom section (2, 3), the products to be heated passing over the rollers and between said sections, said sections forming flux loops which pass upwards and downwards and which close longitudinally, on top of and under the products,
said rollers (2) being made of composite material and each including a magnetic stack and a stiffening element (21), said magnetic stack taking at least half of the roller volume and being made of high magnetic conductivity elements stacked on the roller axis so that the roller forms part of the looped magnetic circuit; said stiffening element being metallic, resisting at least the tension strains and extending in said transverse direction, the whole roller length inside the magnetic stack so that the roller resists the bending strains generated by the weight of the product to be heated,
the improvement wherein said magnetic stack is a laminated stacking constituted by magnetic sheet metal plates, each plate of which having a thickness not in excess of 0.6 mm, and being electrically resistive, and isolated from each other so that the magnetic flux passing through the stack cannot heat it beyond the Curie point of said magnetic plates even when the products (1) are heated beyond 800° C.,
said stiffening element (21) being formed of a nonmagnetic metal so that the magnetic flux through the roller is channelled by the magnetic sheet metal plates on both sides of said stiffening element and cannot heat the latter up to a temperature which might damage its mechanical properties,
each conveyance roller (2) including, in addition, shielding cans (24) distributed across the whole roller length, being of refractory non-magnetic steel and presenting circular bearing edges (24A) coaxial to the roller and radially beyond the magnetic sheet metal plates to form a radial thermal insulation gap (24B) between the sheet metal plates and the products to be heated, born by these bearing edges, and
a heat shield of thermal insulation arranged between the upper side of the product to be heated and a magnetic inductor circuit (4) forming the top section of said looped magnetic circuit above the product and being fitted with said induction coils (5).

4,595,814

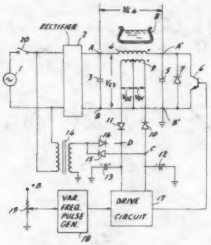
INDUCTION HEATING APPARATUS UTILIZING OUTPUT ENERGY FOR POWERING SWITCHING OPERATION

Yoshio Ogino; Takumi Mizukawa, both of Osaka; Hideki Ohmori, Kawanishi, and Hirokazu Yoshida, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 18, 1983, Ser. No. 524,436
Claims priority, application Japan, Aug. 19, 1982, 57-125565[U]; Sept. 28, 1982, 57-170104
Int. Cl.[4] H05B *6/06*
U.S. Cl. 219—10.77 **11 Claims**

1. An induction heating apparatus comprising a rectifier for rectifying a voltage from an AC mains supply, a resonance circuit formed by an induction heating coil and a capacitor, a unidirectionally conductive semiconductor switching device connected in circuit with said resonance circuit to the output of said rectifier, a unidirectionally conducting device coupled in anti-parallel relationship with said switching device, a circuit for driving said switching device into conduction at a controlled frequency, first means for deriving a low-frequency energy from said AC mains supply, a second coil electromagnetically coupled with said heating coil for deriving a high-fre-

quency energy, and second means for applying said low-frequency energy and said high-frequency energy to said driving circuit to provide power necessary to effect the condition of said switching device,



said second means including means for applying the greater of said low-frequency and high-frequency energies to said driving circuit.

4,595,815

PROCESS AND INSTALLATION FOR WELDING GRIDS FOR NUCLEAR FUEL ASSEMBLIES

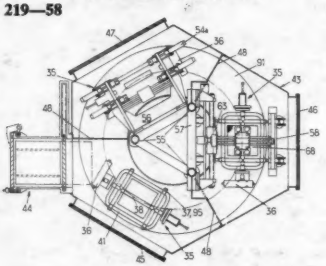
Bernard Vere, Eybens; Paul Mathevon, Bollene, and Jacques Le Pargneux, Lyons, all of France, assignors to Cogema et Framatome, Velizy Villacoublay, France

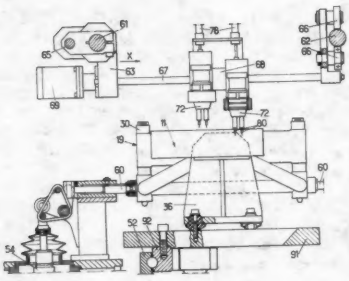
Filed Nov. 9, 1983, Ser. No. 550,151

Claims priority, application France, Nov. 9, 1982, 82 18800

Int. Cl.[4] B23K *9/225, 9/32*

U.S. Cl. 219—58 **9 Claims**





1. A process for forming grids comprising two sets of mutually orthogonal metal plates whose endmost parts are secured to a surrounding metal belt by electrically welding said plates to each other and to said belt, comprising the steps of

(a) assembling two sets of plates and a surrounding belt into a grid;

(b) locating said grid in a frame for putting said grid into shape and for holding it mechanically, said frame being constructed for allowing access to points to be welded on two larger faces and at least two opposite narrower sides of said grid;

(c) placing said frame containing said grid on a device carried by a carrousel for rotation about an axis transverse to an axis of said carrousel;

(d) moving said carrousel for bringing said frame to a first welding position;

(e) welding said plates together on at least one of said larger faces of said grid with electrical welding means movable in two mutually perpendicular directions which are parallel to said one of said faces, whereby said welding means may be brought into alignment with a plurality of first welding points on said larger face;

(f) moving said carrousel to bring said frame to a second welding position and rotating said device and frame through 90°;

(g) welding the plates of at least one of the sets of plates to said surrounding belt with second welding means movable in only one direction; and

(h) repeating the preceding steps until all welds have been carried out.

3. An installation for forming grids comprising a metal belt and two sets of mutually orthogonal metal plates whose endmost parts are secured to said belt by welding said plates to each other and to said belts at crossing points thereof and welding projecting lugs of said plates to said belt, said installation comprising, in an airtight chamber having an air lock:

(a) a carrousel;

(b) means carried by said carrousel and constructed to be rotatable about an axis transverse to the rotation axis of said carrousel, said means having cradle means;

(c) a frame constructed to be removably received by said cradle means and to receive one of said grids;

(d) means for rotating said carrousel, whereby said frame may be brought successively to a first welding position and to a second welding position;

(e) rotation means associated with said cradle for changing the angular position of said frame;

(f) a first welding unit for welding said plates while said frame is in said first welding position, comprising a welding gun and means for moving it parallel to said grid and bringing it in front of each point to be welded and perpendicularly to said grid between a welding position and a retracted position; and

(g) a second welding unit placed at said second welding position which comprises a welding gun movable in a direction parallel to one of the sides of said grid in the orientation given thereto by said rotatable means for welding said plates to said belt.

4,595,816

AUTOMATED SOLDERING PROCESS AND APPARATUS

Richard L. Hall, West Friendship; Frieda S. Jenniches; James R. Kehoe, both of Columbia; David G. Strong, Millersville, and Edward N. Silcott, Reisterstown, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1984, Ser. No. 645,954

Int. Cl.[4] B23K *27/00*

U.S. Cl. 219—121 LD **8 Claims**

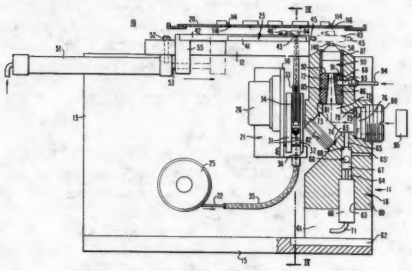
1. A method of soldering under computer program control conductive leads of electronic components in metallic-plated holes of a printed wiring board, where the components are mounted on an upper side of the board and their conductive leads extend into respective holes toward the underside of the board, said method comprising

(1) positioning a crucible beneath and spaced a predetermined distance from a selected hole of the printed wiring board,

(2) depositing a selected volume of non-molten solder in the crucible, said volume being selected to make a single soldered joint,

(3) controlling a laser beam to heat the crucible and the solder in the crucible to a selected required temperature above the molten state,

(4) placing the crucible in a position to abut the underside of the printed wiring board with the molten solder therein immersing the conductive lead and pad adjacent the hole,



(5) maintaining the crucible in the last described position until the molten solder extends into the hole and on the upper side of the printed wiring board,

(6) withdrawing the crucible to increase the space between the crucible and the underside of the board to the predetermined distance of step (1), and

(7) repeating steps (2) through (6) for another through-hole of the printed wiring board.

4,595,817

METHOD OF MECHANICAL MACHINING OF WORKPIECES USING A PLASMA ARC TO HEAT THE CUTTING ZONE

Alexandr V. Bobrov, 2 Schukinsky proezd, 8, kv. 15; Valery V. Zabegalov, ulitsa Marshala Koneva, 4, kv. 18, both of Moscow; Anatoly P. Zabasnenko, ulitsa Lenina, 27, kv. 16, Pavlograd, Dnepropetrovskaya oblast; Nikolai S. Ivchenko, ulitsa Fabrichno-Zavodskaya, 120, kv. 36, Dnepropetrovsk; Lev P. Litvinov, Leninsky prospekt, 12, kv. 32, Moscow; Jury A. Papov, Fergansky proezd, 17, korpus 2, kv. 96, Moscow; Alexandr F. Seregin, ulitsa Katukova, 16, korpus 2, kv. 213, Moscow; Leonid A. Zhukov, ulitsa Shirokaya 5, korpus 1, kv. 47, Moscow; Olga S. Gaponenko, ulitsa Vishnevaya, 10, kv. 5, Skhodnya, Moskovskaya oblast; Alexandr V. Tkachenko, deceased, late of Moscow; by Elena V. Tkachenko, administrator, ulitsa Magnitogorskaya 3, kv. 17, Moscow; Alexandr I. Telenkov, ulitsa Kukhmisterova, 18, kv. 171, Moscow, and Vladimir I. Smychnikov, Zagorodny proezd, 7, korpus 2, kv. 58, Moscow, all of U.S.S.R.

PCT No. PCT/SU83/00007, § 371 Date Nov. 26, 1984, § 102(e) Date Nov. 26, 1984, PCT Pub. No. WO84/03648, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 25, 1983, Ser. No. 680,253

Claims priority, application U.S.S.R., Dec. 12, 1977, 2552691; May 17, 1979, 2766102

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219—121 PY **3 Claims**

1. A method of mechanical machining of metal workpieces using a cutter and a plasma arc to heat the cutting zone, comprising the steps of:

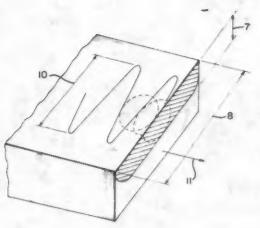
providing a plasma arc to define an anodic spot or a workpiece;

imparting a continuous movement at a constant speed to a workpiece relative to a plasma generator and a cutting tool;

preselecting the maximum depth and width of a metal layer to be cut off the workpiece in a cutting zone;

locating the anodic spot of the plasma arc on the workpiece surface in the cutting zone ahead of the cutting tool and heating the workpiece surface by the anodic spot;

forming a strip of heated metal layer on the workpiece surface in a zone smaller than the width of the layer to be



cut off by the cutting tool by an amount equal to between 1.2 and 2.5 times the selected heating depth of the layer to be cut off;

locating the cutting tool at a distance from the anodic spot of the plasma arc equal to the product of the cutting speed and the heating time of the layer being cut off within the range of cut depth selected; and

cutting the workpiece in the preselected cutting zone.

4,595,818

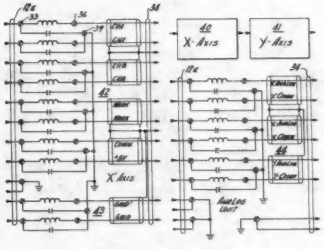
EXTRANEOUS SIGNAL ISOLATION APPARATUS FOR METAL WORKING MACHINES

James A. Nelson, St. Francis, and August C. Mingesz, Milwaukee, both of Wis., assignors to C-R-O, Inc., Milwaukee, Wis.

Filed Aug. 24, 1983, Ser. No. 526,124

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219—121 PV **13 Claims**

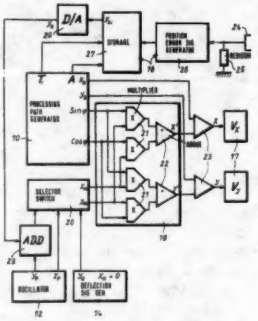


1. A flame cutting machine having a torch support unit carrying at least one plasma torch means including a high frequency igniter and operational components for positoning the torch means and for monitoring the position of the torch means and having an electronic logic controller support unit and having multi-lead cables connected between the torch means and the controller, the improvement in the connection of the controller to the torch means and the operational components comprising a pluraliy of individual filter units connected in the individual leads of said multi-lead cables, said filter units being connected at the logic controller to isolate the controller from extraneous electrical signals in said cable.

4,595,819
METHOD AND SYSTEM FOR DEFLECTING A FOCUSSED ELECTRON BEAM ALONG A PREDETERMINED PROCESSING PATH

Dieter Koch, Stuttgart, Fed. Rep. of Germany, assignor to Institut für Kerntechnik und Energiewandlung e.V., Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 551,871
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1982, 3243033
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EB 25 Claims



1. Method for processing a workpiece by means of a focussed electron beam impinging on said workpiece along a predetermined processing path, and along a micromotion modulation path relative to said processing path, comprising the steps of

approximating said processing path by a sequence of points at predetermined distances from another;

moving said electron beams between respective sequential ones of said points along respective connecting paths at respective preselected velocities;

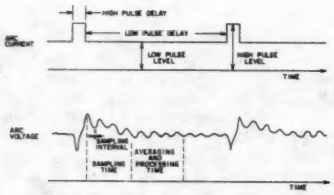
furnishing a direction signal indicative of the direction from each of said points to the next subsequent one thereof; and

changing the direction of said modulation path in accordance with said direction signal, whereby the ensuing micromotion of the electron beam substantially influences the structure of a resulting weld of the workpiece.

4,595,820
APPARATUS AND METHODS FOR CONTROLLING A WELDING PROCESS

Richard W. Richardson, Columbus, Ohio, assignor to The Ohio State University

Continuation-in-part of Ser. No. 456,278, Jan. 6, 1983, abandoned, and Ser. No. 436,026, Oct. 22, 1982, Pat. No. 4,532,408. This application Apr. 23, 1984, Ser. No. 603,296
Int. Cl.[4] B23K *9/09*
U.S. Cl. 219—137 PS 15 Claims

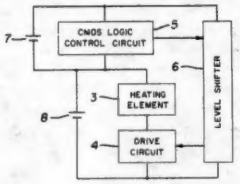


1. A process for controlling an arc welding process comprising the steps of: beginning a weld by providing electrical current to form an arc between a welding electrode and a base metal to thereby form a weld pool of liquid metal on said base metal; measuring the natural frequency of oscillation of said weld pool; determining the position of a first edge of the pool by analyzing light reflected from the surface of said weld pool and the adjacent base metal in a direction parallel to but non-coincident with the axis of the welding electrode for a first local light intensity minimum; determining the position of a second edge of said pool by a similar method on the opposite side of said pool; determining the distance between said first and second edges of said pool to determine a width; adjusting the electrical current of said arc welding process in response to said frequency and width to maintain a constant pool mass and a constant width between said first and second pool edges.

4,595,821
SEMICONDUCTOR DEVICE FOR USE WITH A THERMAL PRINT HEAD

Yoshiaki Matsuura, Tokyo, Japan, assignor to Seikosha Instruments & Electronics Ltd., Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,859
Claims priority, application Japan, Sep. 27, 1982, 57-168135
Int. Cl.[4] B41J *3/20*
U.S. Cl. 219—216 4 Claims

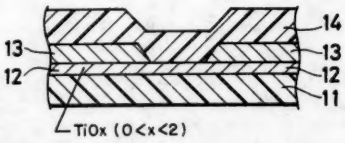


1. A semiconductor device for use with a thermal print head comprising: a logic control circuit comprised of at least one MOS; a level shifter having an input connected to an output of the logic control circuit; a drive circuit consisting of an MOS having a gate connected to an output of the level shifter; and a heating element connected to be driven by the drive circuit to generate heat.

4,595,822
THERMAL HEAD AND PRODUCING PROCESS THEREOF

Yasuo Nishiguchi, and Keijiro Minami, both of Kagoshima, Japan, assignors to Kyocera Corporation, Japan

Filed Jun. 13, 1984, Ser. No. 620,067
Claims priority, application Japan, Jun. 14, 1983, 58-106918
Int. Cl.[4] H05B *3/00*; B41J *3/20*
U.S. Cl. 219—216 4 Claims



1. A thermal head comprising:

a substrate comprising an electrically insulative material;

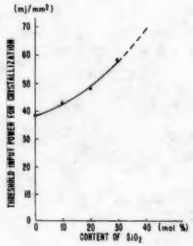
a resistive film substantially composed of TiO_x ($0<\times<2$); and

an electrode formed on one surface of said resistive film.

4,595,823
THERMAL PRINTING HEAD WITH AN ANTI-ABRASION LAYER AND METHOD OF FABRICATING THE SAME

Haruo Sorimachi, Tokyo; Kiyoshi Satoh, Kawasaki, and Takumi Suzuki, Yokohama, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 19, 1984, Ser. No. 590,887
Claims priority, application Japan, Mar. 17, 1983, 58-44781
Int. Cl.[4] G01D *15/10*; B47J *3/20*
U.S. Cl. 219—216 6 Claims

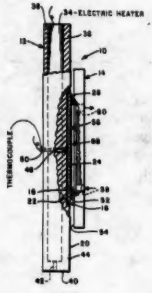


1. A thermal printing head, comprising:
a substrate;
heating elements formed on said substrate;
conductors formed on and contacting said heating elements;
an anti-oxidation layer covering said heating elements and said conductors; and
an anti-abrasion layer formed over said anti-oxidation layer, said anti-abrasion layer comprising a uniform mixture of a tantalum pentaoxide anti-abrasion compound and a silicon dioxide anti-crystallization compound.

4,595,824
HEATER BLOCK ASSEMBLY FOR USE IN THERMAL OXIDATION TESTING OF JET FUEL

Robert A. Harvey, Cheyenne, Wyo., and Robert W. Morris, Jr., West Liberty, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 19, 1984, Ser. No. 651,983
Int. Cl.[4] H05B *1/02*; F24H *1/10*
U.S. Cl. 219—302 3 Claims

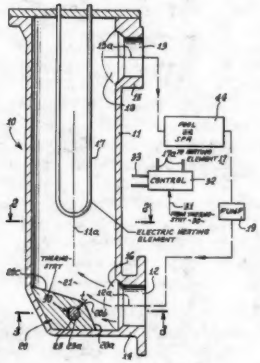


1. A heater block assembly for use in a jet fuel thermal oxidation test apparatus, comprising:
a. a back plate;
b. a front plate;
c. a test plate disposed between said back and front plates and having a flat surface defined thereon;
d. means on the rear face of said front plate defining a rearwardly facing channel, and means defining an inlet to and an outlet from said channel;
e. means for clamping said back and front plates together with said test plate therebetween so as to seal said test plate against the rear face of said front plate thereby covering said channel to define a fuel sample flow passage between said flat surface on said test plate and said channel on said front plate; and
f. means connected to said back plate for heating the same and said test plate therewith clamped between said back and front plates, said heating means being in the form of a pair of heating rods inserted into said back plate at laterally spaced locations such that a portion of said back plate extending between said rods, and said test plate disposed in contact with said back plate portion, are heated so as to have a substantially uniform temperature gradient across them.

4,595,825
THERMOSTATICALLY CONTROLLED ELECTRIC WATER HEATER

Manochehr Gordbegli, Santa Ana, Calif., assignor to Purex Pool Products, Inc., Lakewood, Calif.

Filed Jun. 18, 1984, Ser. No. 621,791
Int. Cl.[4] H05B *1/02*; F24H *1/10*
U.S. Cl. 219—306 9 Claims



1. A water heater, comprising
(a) a metallic body having a lengthwise elongated hollow and inlet and outlet openings directly communicating with said hollow at spaced intervals therealong, for flowing water therethrough,
(b) means to heat the flowing water,
(c) the body having an integral thick body portion past which water flows and in contact with said body portion,
(d) an opening formed in said thick body portion, said opening being isolated from the flowing water,
(e) and a heat sensing element received in said opening in said body portion and in heat transfer communication with the water flowing past said body portion,
(f) said body forming an elbow passage to corner-turn the water flow path proximate one of said inlet and outlet openings, said thick body portion projecting into said elbow passage at the location at which water flow corner-turns, the thick body portion having a first surface directly facing one of said inlet and outlet openings, and a second surface directly facing lengthwise of and toward the elongated hollow, said surfaces merging at a convex locus extending widthwise across said elbow, said heat sensing element receiving opening extending substantially parallel to the widthwise extent of said convex locus.

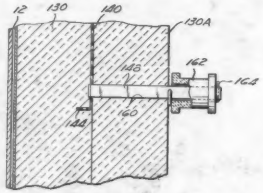
4,595,826
HEAT TREATMENT FURNACE AND METHOD OF CONSTRUCTION

Reginald F. Duran, 231 E. Borromeo, Placentia, Calif. 92670, and Jack L. Brass, 5650 Via Ceresa, Yorba Linda, Calif. 92686

Division of Ser. No. 368,307, Apr. 14, 1982, abandoned. This application Oct. 5, 1984, Ser. No. 637,316

Int. Cl.[4] H05B *3/06*

U.S. Cl. 219—400 **6 Claims**



1. In a heat treatment furnace having a housing, a heat treatment chamber disposed within the interior of said housing sized to receive parts therein and a fan for circulating a quantity of air through said heat treatment chamber, the improvement comprising:

a first insulation layer affixed to the interior of said housing, said first layer formed of a readily deformable ceramic fiber material;

a rigid cartridge mounted to one surface of said first insulation layer and maintained in a generally contiguous orientation with said first layer;

a second insulation layer affixed to said one surface of said first insulation layer and sized to cover said rigid cartridge, said second insulation layer formed of a readily deformable ceramic fiber material; and

a thin ribbon heating element mounted in tension between plural pins extending outward from said rigid cartridge and through said second insulation layer said heating element adapted to heat by convection, a quantity of air circulating through said heat treatment chamber.

4,595,827
COOKING APPARATUS WITH WEIGHING DEVICE

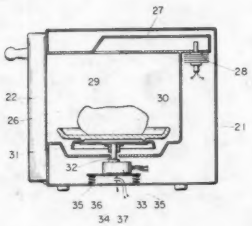
Kazumi Hirai, Nabari; Mitsuo Akiyoshi, Nara; Chikao Nakano, Yamatokoriyama; Kenji Watanabe, and Satoru Kodama, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 29, 1985, Ser. No. 728,610

Claims priority, application Japan, May 2, 1984, 59-88702; Jun. 8, 1984, 59-118445; Jul. 26, 1984, 59-155829

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—518 **2 Claims**



1. A cooking apparatus with weighing device comprising:

a heating chamber for housing and heating an object to be heated;

a heating source for heating the object;

a rotary table disposed inside said heating chamber for mounting the object;

a driving device for rotating said rotary table;

a resilient member supporting both said rotary table and said driving device, said resilient member, said driving device and said rotary table being movable as a unit in a vertical direction in dependence of the weight of an object mounted on said rotary table; and

detector means for detecting a vertical movement of one of said rotary table, said driving device and said resilient member, said detector means including means for determining the weight of an object on said rotary table from a detection of the vertical movement and for producing an output signal corresponding to said weight, the operation of said heating source being controlled by said output signal.

4,595,828
WALL-MOUNTED APPARATUS FOR DISPENSING AND/OR DEPOSITING VALUABLE PAPERS

Leif Lundblad, Häradsvägen 102, S-141 41 Huddinge, Sweden

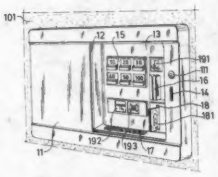
PCT No. PCT/SE83/00094, § 371 Date Oct. 25, 1983, § 102(e) Date Oct. 25, 1983, PCT Pub. No. WO83/03317, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 17, 1983, Ser. No. 556,236

Claims priority, application Sweden, Mar. 17, 1982, 8201781

Int. Cl.[4] G06F *15/30*

U.S. Cl. 235—379 **6 Claims**



1. An apparatus for dispensing valuable papers such as banknotes, cheques etc. from a store to a customer receipt opening and/or for depositing such valuable papers to a safety deposit chamber located within the apparatus, said apparatus comprising a cabinet for housing various apparatus components, such as said store and/or said safety deposit chamber, transport means for transporting valuable papers from the store to the customer receipt opening and/or for transporting such papers to the safety deposit chamber, keyboards and electronic unit for controlling the dispensing and/or depositing procedure, and an energy supply unit for supplying electrical energy to the electronic unit, the transport means etc., in which apparatus the cabinet comprises two part cabinets **(11, 31)** and in which part of said transport means **(25)** is arranged between said part cabinets **(11, 31)**, said part having a cross-sectional surface whose area is substantially smaller than the area of the cross-sectional surface of at least one part cabinet **(31)**, characterized in that said part of said transport means **(25)** is arranged to be positioned substantially horizontally, and in that the length of said transport means can be adjusted longitudinally to the distance between the part cabinets **(11, 31)**.

4,595,829

APPARATUS FOR AUTOMATICALLY FOCUSING OBJECTS TO BE VIEWED IN OPTICAL INSTRUMENTS

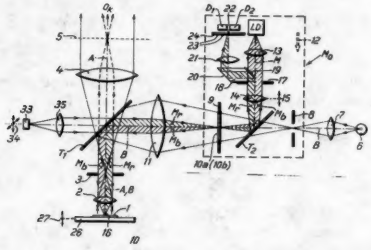
Burkhard Neümann, Schoeffengrund, and Günter Reinheimer, Biebertal, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,587

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219503

Int. Cl.[4] G01J 1/20

U.S. Cl. 250—201 20 Claims



1. An apparatus for automatically focusing objects to be viewed in optical instruments having an illuminating beam path passing through an objective, onto an object to be positioned in the focal plane of said objective, said apparatus comprising:

a laser light source for producing a full measuring beam having a defined path;

an optical structural element positioned for geometrically blocking a portion of said full measuring beam path to produce an eccentric measuring beam;

means for reflecting said eccentric measuring beam into said illumination beam path, and reflecting a reflected eccentric measuring beam out of said illumination beam path into the blocked portion of said full measuring beam path, whereby said eccentric measuring beam passes through said objective, is focused by said objective as a measuring point on said object and is reflected eccentrically along said illumination path, and said eccentric reflected measuring beam is reflected out of said illumination path into the blocked portion of said full measuring beam path;

a differential photodetector;

means for passing said reflected eccentric measuring beam from said blocked portion of said full measuring beam path onto said differential photodetector to form an image of said measuring spot on on said differential photodetector, comprising a reflective side of a surface on said optical structural element positioned to geometrically block the reflected eccentric measuring beam out of said blocked portion of said full measuring beam path; and

an axially adjustable lens positioned in the path of said eccentric measuring beam and said eccentric reflected measuring beam for optically adjusting said eccentric measuring beam and said eccentric reflected measuring beam,

wherein the position of said image of said measuring spot wanders on said photodetector in dependence on the focal position of said object relative to said objective focal plane.

4,595,830

MULTIMODE OPTICAL FIBER ACCELEROMETER

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,264

Int. Cl.[4] G01D 5/34; G01P 15/08

U.S. Cl. 250—227 49 Claims

1. A grating accelerometer, comprising:

light input means, having an output face, for receiving light and providing an output of light from said output face;

an elastic beam, having two ends, fixed at a first end;

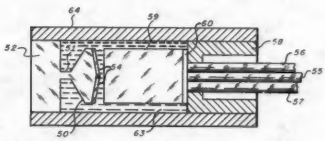
means for fixing said elastic beam at said first end;

a proof mass, affixed to a second end of said elastic beam, for assuming a tilt in response to acceleration applied to said accelerometer, said tilt being representative of a degree of said acceleration;

a grating, disposed before and covering said output face of said light input means;

lens means, disposed between said grating and said proof mass, for transforming light passing through said grating from said output face of said light input means into a collimated beam;

bifurcating means, disposed between said proof mass and said lens means, responsive to said tilt of said proof mass, for producing two beams of light from said collimated beam, and for projecting said two beams of light into said lens means,



said lens means additionally for focussing said two beams of light;

two light output means, each having an input face disposed in a focal region of said lens means, each for receiving light with said input face, and each for providing an output of light,

said grating being disposed in said focal region of said lens means between said lens means and said input faces of said two light output means covering said input faces,

said outputs of light of said two light output means being produced from light received from, respectively, said two beams, after said two beams are focussed by said lens means and pass through said grating, individual outputs of light of said two light output means considered together being representative of said tilt of said proof mass, and thereby being representative of said degree of said acceleration.

4,595,831

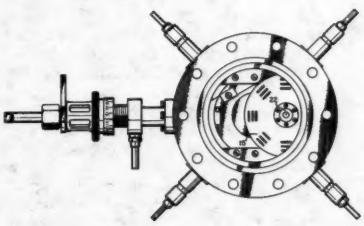
MULTIPLE MASS RANGE TRIPLE COLLECTOR SPECTROMETER

Ernest A. Hetherington, Jr., Duncanville, and Cecil M. Orr, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 9, 1983, Ser. No. 549,852

Int. Cl.[4] B01D 59/44

U.S. Cl. 250—281 8 Claims



1. A mass spectrometer comprising:

a source of ions emanating from a sample;

means for separating beams of said ions according to mass;

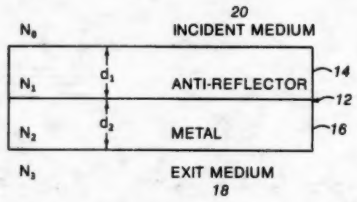
multiple collectors for measuring the intensity of said beams;
a resolving plate having a plurality of aperture clusters, the clusters having apertures with different separations which allow beams of different predetermined ion mass to pass through to impinge upon said collectors; and
a shaft, said resolving plate being rotatable on said shaft to selectively position one of said aperture clusters between said beams and said collectors with each aperture in the cluster corresponding with one of said collectors.

4,595,832

THERMAL SENSOR WITH AN IMPROVED COATING

Peter C. LaDelfe, and Suzanne C. Stotlar, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1984, Ser. No. 595,204
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—338 **6 Claims**



1. An apparatus for detecting electromagnetic radiation in the form of high speed laser pulses of at least 50 MHz, the radiation having wavelengths from about 0.4 μm to about 5.6 μm, said apparatus comprising:
a. a pyroelectric thermal sensing means for generating an electrical signal in response to impinging radiation, said thermal sensing means having a top and a bottom surface, said impinging radiation being directed toward said top surface;
b. a first electrode for receiving and conducting electrical charges generated on said top surface of said thermal sensing means, said first electrode being disposed on said top surface;
c. A second electrode for receiving and conducting electrical charges generated on said bottom surface of said thermal sensing means, said second electrode being disposed on said bottom surface; and
d. an optical coating for increasing the absorption of the impinging radiation, said optical coating including a first metallic layer disposed on said first electrode, and a first anti-reflector disposed on said first metallic layer, said optical coating having a thickness of less than 2000 Å and a mass of less than 100 $\mu g/cm^2$, said optical coating placing a sufficiently small thermal load on said sensing means that said sensing means has a response time of less than one nanosecond.

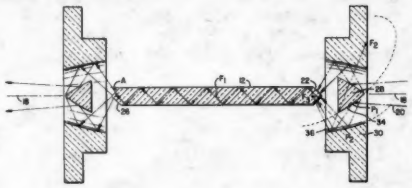
4,595,833

MULTIPLE INTERNAL REFLECTION CELL OPTICAL SYSTEM FOR USE IN INFRARED SPECTROPHOTOMETRY OF LIQUID AND FLUIDIZED SAMPLES

Donald W. Sting, 358 Turtleback Rd., New Canaan, Conn. 06840

Filed Sep. 20, 1983, Ser. No. 534,220
Int. Cl.[4] G01N *21/35*
U.S. Cl. 250—353 **33 Claims**

1. Optics in combination with a cylindrically shaped internal reflection element forming an optical system for a multiple internal reflection cell, the optics comprising:
first optical means in the form of reflaxicon optics responsive to radiation from collimated to f number 1 from a source of infrared radiation for focusing the radiation on an entry end of the element at an angle of incidence conducive to transfer of substantially all the radiation to the element;
the radiation transferred to the element being multiply internally reflected through the element from the entry end to an exit end of the element; and



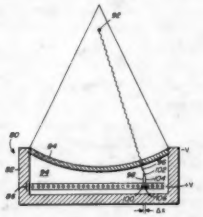
second optical means in the form of reflaxicon optics responsive to substantially all radiation emanating from the exit end of the element for transmitting the radiation in a pattern for optimum throughput to a detector.

4,595,834

LOW PARALLAX ERROR RADIATION DETECTOR

Ronald E. Burns, 57 Frost St., Cambridge, Mass. 02140

Filed May 23, 1984, Ser. No. 613,869
Int. Cl.[4] H01J *47/06*
U.S. Cl. 250—374 **4 Claims**



1. Apparatus for imaging radiation from sources located at variable distances from the apparatus comprising:
a gas tight housing including a concave radiation permeable entrance window having a preselected radius of curvature and depth which allows radiation from point sources to enter the interior of the housing;
a detector electrode assembly spaced apart from the window;
a gas contained within the housing having a half absorption layer thickness less than 0.05 of the radius of curvature of the window; and
means for producing an electrostatic field between the entrance window and the detector electrode assembly, the electrostatic field being spherically symmetric near the entrance window and focused on the center of curvature of the window.

4,595,835

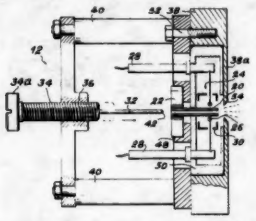
MATERIAL IONIZING DEVICE

Yves Boulin, Chilly Mazarin; Jean Cesario, Verrieres le Buisson, and Bernard Landeau, Marcoussis, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 19, 1983, Ser. No. 524,828
Claims priority, application France, Aug. 30, 1982, 82 14774
Int. Cl.[4] H01J *37/00*
U.S. Cl. 250—423 R **7 Claims**

1. A device for thermally ionizing a solid material, comprising a tube open at its first and second ends, means for heating the first end of the tube to a temperature to affect thermal ionization of said material, the second end of the tube being kept at a relatively low temperature, so as to produce a temperature gradient between the said ends of the tube and means for introducing the material into the tube by the second end

thereof comprising, a rod, at one end of which is deposited said material, and means for displacing said rod in a controlled



manner within the tube, and means for detecting the resultant thermal ionization of the material.

4,595,836

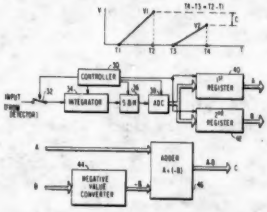
ALIGNMENT CORRECTION TECHNIQUE

Robert A. Simpson, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,368

Int. Cl.[4] G01N *23/00*

U.S. Cl. 250—491.1 **7 Claims**



1. A beam alignment system for comparing first and second input analog voltage signals and generating a correction value comprising:

an integrator;

an A/D converter connected to said integrator; first and second registers;

a digital comparator; and,

a controller for operating said integrator and connecting said A/D converter to said first register to thereby store a digital representation of said first voltage in said first register, and for subsequently connecting said A/D converter to said second register to thereby store a digital representation of said second voltage in said second register, said controller subsequently connecting said first and second registers to said digital comparator to thereby combine the digital representations of said first and second analog voltages and produce a correction signal wherein signal path error are eliminated.

4,595,837

METHOD FOR PREVENTING ARCING IN A DEVICE DURING ION-IMPLANTATION

Chung P. Wu, Hamilton Township, Mercer County, and Frank Kolondra, Delaware Township, Hunterdon County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 532,897, Sep. 16, 1983. This application Sep. 12, 1985, Ser. No. 775,942

Int. Cl.[4] H01J *37/317*

U.S. Cl. 250—492.2 **7 Claims**

1. A method for calibrating an ion implanter apparatus for preventing arcing in insulated devices during ion implantation, said ion implanter apparatus having a Faraday cage, each of said devices having a surface or being formed on a surface that is an insulator comprising the steps of:

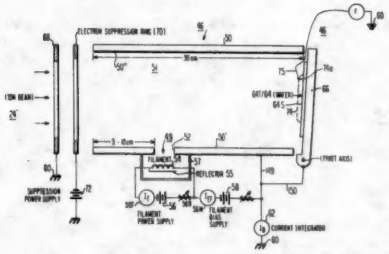
(a) positioning an insulating test substrate on said apparatus in ion implant position, said substrate having one surface in exposure position to the ion beam

(b) providing an electrode on a portion of said surface of said substrate;

(c) irradiating said electrode and the remaining surface portion of said substrate with a beam of ions;

(d) measuring the current of said beam to determine the dose of said ions on said electrode;

(e) measuring the voltage on said electrode, said voltage being an indication of the charge on the electrode induced by the ion beam; and



(f) flooding said ion beam in said Faraday cage with electron flood emission currents having a value greater than the current needed to neutralize the positive space-charge of said ion beam and sufficient to provide a slight negative charge on said electrode, by varying the electron flood emission current until the charge on said electrode is substantially zero indicating substantially complete neutralization of the ion space-charge;

whereby said implanter is calibrated for subsequent use to implant said devices and to prevent arcing in said devices during ion implantation.

4,595,838

IRRADIATION DEVICE

Johann J. Kerschgens, Prinz-Ludwig-Strasse 5, D-8918 Diessen am Ammersee, Fed. Rep. of Germany

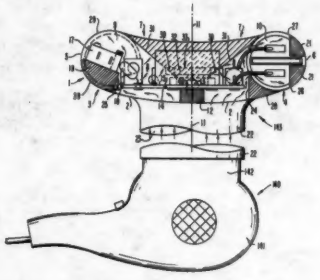
PCT No. PCT/EP83/00227, § 371 Date Apr. 20, 1984, § 102(e) Date Apr. 20, 1984, PCT Pub. No. WO84/00897, PCT Pub. Date Mar. 15, 1984

PCT Filed Aug. 29, 1983, Ser. No. 608,940

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232537; Dec. 9, 1982, 3245654; Dec. 9, 1982, 3245655; Jun. 18, 1983, 8317832[U]

Int. Cl.[4] A61N *5/06*

U.S. Cl. 250—504 R **71 Claims**



1. An irradiation device comprising in combination a blower, a source of radiation that emits ultraviolet radiation and is connected through a voltage-dropping impedance to an AC power source, the radiation source being operable in conjunction with the flow of air produced by the blower, the voltage-dropping impedance being capacitive, the source of radiation (33) being arranged in the air flow from the blower

(140), means for determining a temperature of the source of radiation at a predetermined operating point; and means for controlling the air flow of the blower upon a temperature increase or a temperature reduction of the source of radiation for cooling the source of radiation in dependence from a temperature change in such a manner that the instantaneous value of the restriking voltage is less than or equal to the instantaneous value of the line voltage.

4,595,839

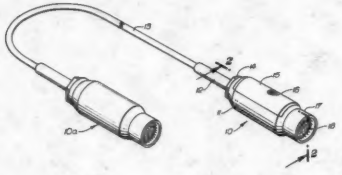
BIDIRECTIONAL OPTICAL ELECTRONIC CONVERTING CONNECTOR WITH INTEGRAL PREAMPLIFICATION

Steven W. Braun, Encinitas, and Henri Hodara, Altadena, both of Calif., assignors to Tetra-Tech, Inc., Pasadena, Calif.

Continuation of Ser. No. 431,574, Sep. 30, 1982. This application May 15, 1985, Ser. No. 734,805

Int. Cl.[4] G02B *6/42*

U.S. Cl. 250—551 **13 Claims**



1. A bidirectional cable assembly that links a first and a second apparatus which intercommunicate over wide geographical separations on land by respectively transmitting and receiving electrical signals to and from said cable assembly, which cable assembly is subject to being laid out over such wide geographical separations with either end adjacent to such receiving apparatus, and such first and second apparatus having respective electrical connector means for mating with said cable assembly to effect such transmitting and receiving; said cable assembly comprising:

a cable having throughout its length two substantially identical optical fibers for transmitting optical signals along the length of the cable, and having along its length exterior protective elements; and

two substantially identical connectors, one at each end of the cable, and each connector comprising:

a connector housing,

a light emitter mounted within the housing,

a light detector mounted within the housing,

an electrical pin subassembly adapted to mate with such electrical connector means of such apparatuses,

means for optically coupling the optical fibers to the emitter and detector in such fashion that the emitter of each connector is optically coupled via one optical fiber to the detector of the other connector, and

operational electrical connections between the emitter and the pin subassembly, and between the detector and the pin subassembly; and

the cable assembly being substantially symmetrical, and fully operational regardless of which connector means are attached to such receiving apparatus.

4,595,840

PROCEDURE AND MEANS FOR OBSERVING STREAKS IN THE MACHINE DIRECTION IN PAPER OR IN ITS COATING

Pertti Puumalainen, Kuopio, Finland, assignor to Enso-Gutzeit Oy, Helsinki, Finland

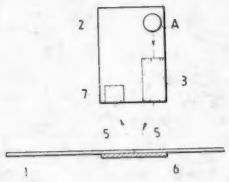
Filed Jun. 27, 1984, Ser. No. 624,933

Claims priority, application Finland, Jun. 28, 1983, 832347

Int. Cl.[4] G01N *21/88*

U.S. Cl. 250—572 **2 Claims**

1. A procedure of detecting streaks extending in the machine direction of a paper web in which the paper web is moved continuously in said direction and the detecting is carried out with the use of a measuring box having a path of travel in a direction transverse to that of the movement direction of the web, said box being provided with means for producing a number of mutually spaced light beams of substantially equal intensities spaced from each other in the direction of the path of travel of the box, and said box being further provided with a number of detectors adapted to measure the intensities of light beams entering the box, the detection comprising the steps of moving the measuring box along its path of travel across the moving web, producing the number of light beams and directing the light beams from the measuring box to the



web, reflecting the light beams which have met the web to the detectors in the measuring box and measuring the intensities of the reflected beams so that a streak in the machine direction of the web is detected as a sequence of similar disturbances in the intensities measured by the different detectors, caused by sequential crossing of the mutually spaced light beams and the detectors over the streak, and wherein reflection of the beams is achieved by means of a mirror facing the path of travel of the measuring box on the other side of the moving web.

4,595,841

FULL-COVERED PORTABLE GENERATOR

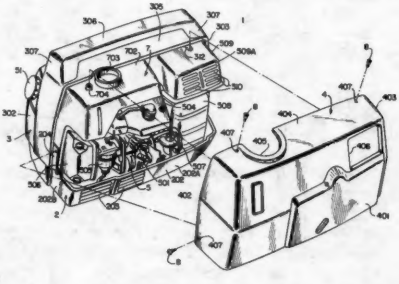
Tadahiro Yaguchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,610

Claims priority, application Japan, Mar. 18, 1983, 58-45590; Mar. 18, 1983, 58-39544[U]

Int. Cl.[4] H02P *9/04*; F02B *63/04*

U.S. Cl. 290—1 A **10 Claims**



1. A full-covered portable generator having a bottom portion, a front portion, a rear portion, and a lateral peripheral portion between said front portion and said rear portion, said generator comprising:

an engine having an obliquely disposed cylinder section; a plurality of components for said engine juxtaposed to said cylinder section; a generator core driven by said engine; a plurality of control means for controlling said engine and said generator core; a bottom cover element formed of steel plate covering the bottom portion of said generator and comprising a base for supporting said engine and said generator core; a molded front cover element covering the front portion of said generator and having an opening therein, said control means being located on said front cover element; and a rear cover element covering said rear portion of said generator, said rear cover element being detachably joined to said front cover element along a vertical joining plane therebetween at said lateral pe-

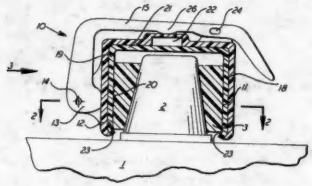
ripheral portion of said generator such that said front cover element and said rear cover element are horizontally separable at said vertical joining plane, each of said cylinder section of said engine and said engine components having at least a portion thereof disposed within said rear cover element.

4,595,842

PROTECTION DEVICE FOR ELECTRONIC COMPONENTS IN VEHICLES

Norman P. Soloway, Nine Elms Farm, Amherst, N.H. 03031

Filed Sep. 7, 1984, Ser. No. 648,788
Int. Cl.[4] H01R *11/26*
U.S. Cl. 307—10 R **11 Claims**



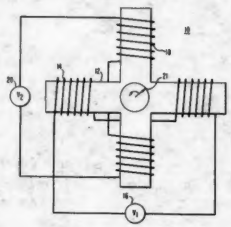
1. A protection device, for electronic components of vehicles having a vehicle battery including a battery terminal and an electrical supply clamp attached thereto forming a battery terminal-clamp combination, comprising electrically conductive means engageable with said battery terminal-clamp combination, means for connecting said electrically conductive means to said electronic components, means for attaching said electrically conductive means to said terminal-clamp combination, to provide electrically conductive engagement therewith and for permitting removal of said electrically conductive means therefrom, when desired, and electrically insulative cover means to encompass and cover all readily accessible surfaces of said electrically conductive means and said terminal-clamp combination when said conductive means is clamped.

4,595,843

LOW CORE LOSS ROTATING FLUX TRANSFORMER

Robert M. DelVecchio, Sunnyvale, Calif., and Robert F. Krause, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1984, Ser. No. 607,852
Int. Cl.[4] H01H *85/02*
U.S. Cl. 307—83 **24 Claims**



1. A transformer, comprising:

first and second alternating source voltages having the same frequency but phase displaced by about ninety electrical degrees;

a magnetic core in the form of a closed magnetic loop having an outer surface disposed about a longitudinal axis, and an axially extending opening;

a toroidal primary winding responsive to the first source voltage and disposed about the outer surface of said magnetic core for establishing a first magnetic flux therein;

a poloidal primary winding responsive to the second source voltage and disposed through the axially extending opening of said magnetic core for establishing a second magnetic flux therein;

a first secondary winding disposed in inductive relation with said magnetic core and a selected one of said primary windings for providing a first secondary voltage;

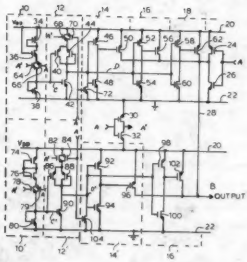
wherein the magnitudes of said first and second source voltages are selected to substantially saturate the entire magnetic core, with the specified phase relationship, configuration of said magnetic core, and placement of said primary windings causing the vector sum of the sinusoidal induction vector produced by said primary windings to rotate through approximately 360° during one cycle of the first and second alternating source voltage, to substantially reduce hysteresis losses in said magnetic core.

4,595,844

CMOS HIGH CURRENT OUTPUT DRIVER

Shannon N. Shen, Trumbull, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,030
Int. Cl.[4] H03K *3/26, 3/01, 17/687*
U.S. Cl. 307—270 **5 Claims**



1. A driver circuit for supplying current through an output port from a power supply in response to an input signal, comprising:

means for sensing the voltage level of said power supply that generates a sensed voltage that varies in accordance with said power supply voltage;

biasing means for amplifying said sensed voltage to generate a biasing voltage; and

a plurality of output stages that supply current to said output port, each output stage having an input port, said output stages being activated by appropriate voltages on their input ports, whereby said biasing means can selectively activate said output stages when said biasing voltage is applied to the input ports, each said output stage including two complementary transistors forming an output inverter, said inverter being activated by said biasing means and each said output stage further including an output transistor for supplying current from said power supply to said output port, said output transistor being activated by said output inverter.

4,595,845

NON-OVERLAPPING CLOCK CMOS CIRCUIT WITH TWO THRESHOLD VOLTAGES

Willard S. Briggs, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Mar. 13, 1984, Ser. No. 589,192
Int. Cl.[4] H03K *19/096, 17/30*
U.S. Cl. 307—443 **1 Claim**

1. A CMOS integrated circuit comprising:

clock means for generating at least one clock signal;

clock distribution means for distributing said at least one clock signal to selected points within said integrated circuit;

a high voltage distribution network;

a ground distribution network;

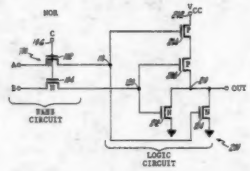
at least two controllable logic circuits, each having an input terminal, an output terminal and a control terminal, for performing logical operations under control of a clock signal at said control terminal, on an input signal on said input terminal; characterized in that:

said clock means generates two non-overlapping clock signals;

said distribution means comprises two electrically isolated distribution networks for distributing said two non-overlapping clock signals; and

all of said at least two controllable logic circuits comprise at least one transmission gate and at least one logic unit, said at least one transmission gate and logic unit sharing an intermediate node that couples the output of said transmission gate to the input of said logic unit;

each controllable logic circuit comprises a pull-up section connected between said high voltage distribution network and said output terminal of said logic circuit and a pull-down section connected between said output terminal of said logic circuit and said ground distribution network;



in which controllable logic circuits, all of said transmission gates comprise at least one N-channel pass transistor connected between said input terminal and said intermediate node and having a gate controlled by one of said non-overlapping clock signals, said N-channel pass transistors all having a standard threshold voltage; and

in which controllable logic circuits all of said pull-down sections comprise at least one N-channel transistor having said standard threshold voltage and being connected in a path between said output terminal and ground and having a gate connected by signal transfer means to said intermediate node; and

in which controllable logic circuits all of said pull-up sections comprise at least one P-channel transistor having a non-standard P-channel negative threshold of absolute value greater than 1.5 volts connected in a path between said high voltage distribution network and said output terminal and having a gate connected by signal transfer means to said intermediate node;

whereby said controllable logic circuits in said CMOS integrated circuit may be constructed with only two different threshold voltages:

a standard N-channel threshold voltage; and

a non-standard P-channel threshold voltage.

4,595,846

ELECTRONIC CIRCUIT FOR AMPLITUDE VARIATION AND LEVEL DISPLACEMENT OF A SIGNAL

Marco Morelli, Leghorn, Italy, assignor to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Dec. 7, 1983, Ser. No. 558,882

Claims priority, application Italy, Dec. 22, 1982, 24905 A/82

Int. Cl.[4] G06G 7/12

U.S. Cl. 307—490 **3 Claims**

1. An electronic circuit for amplitude variation and level displacement of a signal, comprising:

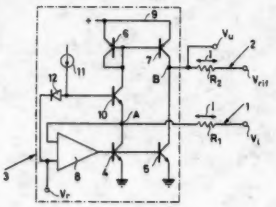
a first circuit branch including a first resistance and supplied with an input voltage signal;

a second circuit branch including a second resistance and provided with a reference voltage; and

a circuit coupling interposed between said circuit branches to cause them to conduct respective currents of the same value, said coupling circuit comprising:

first and second pairs of transistors, the transistors of each pair being equal to one another, with the bases of the two transistors of the first pair being interconnected and the bases of the second pair of transistors being interconnected, and with the transistors of the first pair serially connected with respective transistors of the second pair;

a first circuit node between a first transistor of the first pair and a first transistor of the second pair being connected to said first circuit branch; and



a second circuit node between the second transistor of the first pair and the second transistor of the second pair being connected to said second circuit branch, so that the first and second pairs of transistors are alternatively conducting according to the sign of the input voltage signal and the transistors of each pair are passed through by respective currents equal to each other and to those circulating in said current branches, an output voltage signal being made available at a circuit output connected to said second circuit node of the coupling circuit.

4,595,847

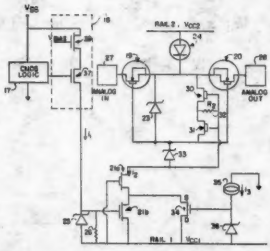
BI-DIRECTIONAL HIGH VOLTAGE ANALOG SWITCH HAVING SOURCE TO SOURCE CONNECTED FIELD EFFECT TRANSISTORS

Basil Weir, San Jose, Calif., assignor to Telmos, Inc., Sunnyvale, Calif.

Filed Oct. 20, 1983, Ser. No. 543,747

Int. Cl.[4] H03K 17/08, 17/687, 17/10, 17/16

U.S. Cl. 307—574 **7 Claims**



1. A bi-directional high voltage switch comprising:

a pair of depletion mode MOS transistors having their sources connected together to form a common source and having their gates connected together to form a common gate and having their drain connections exposed externally to serve, respectively, as a high voltage analog input port and a high voltage analog output port, each of said depletion mode MOS transistors having the characteristic that it conducts so long as the voltage on its gate relative to the voltage on its source does not cause pinch off of said depletion mode MOS transistor;

a diode;

at least a first and a second voltage rail, said second voltage rail being connected to said common source through said diode; and

means for controlling said common gate-to-common source

voltage of said pair of depletion mode MOS transistors, said means for controlling including

an enhancement mode transistor having a gate, a source and a drain, said drain being connected to said common gate of said pair of depletion mode MOS transistors, said source being connected to said first voltage rail,

a pair of MOS transistors having a source-to-drain connection, the external drain being connected to said common source of said pair of depletion mode transistors and the external source being connected to said common gate and further being connected through a diode to said drain of said enhancement mode transistor, the gates of said pair of MOS transistors being connected to said drain of said enhancement mode transistor.

4,595,848

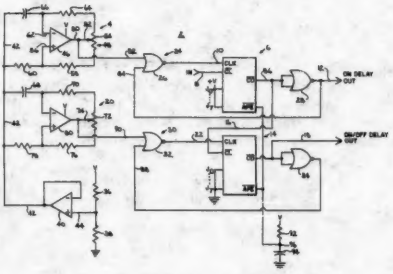
ADJUSTABLE FREQUENCY ON/OFF DELAY CIRCUIT

Lawrence J. Ryczek, Nashotah, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 30, 1983, Ser. No. 509,948

Int. Cl.[4] H03K *5/13, 5/159*

U.S. Cl. 307—597 **12 Claims**



1. A timing circuit comprising:

adjustable frequency oscillator means; and

counter means enabled by an input signal and clocked by said oscillator means and outputting an output signal delayed by a given count;

wherein said counter means delays an input ON signal, and comprising second counter means responsive to the first said counter means for delaying an input OFF signal;

wherein said input ON and said input OFF signals are each input to said first counter means, and wherein delayed output ON and OFF signals are output from said second counter means;

and comprising second adjustable frequency oscillator means for clocking said second counter means and controlling the OFF delay, and wherein the first said adjustable frequency oscillator means controls the ON delay;

wherein said input ON and OFF signals are carried on an input line connected to a clearing input of said first counter means, a carryout output of said first counter means is connected to a clearing input of said second counter means and comprising first gate means connected between said carryout output of said first counter means and a clocking input of said first counter means for inhibiting or allowing clocking therethrough of said first counter means by said first adjustable frequency oscillator means, and comprising second gate means connected between a carryout output of said second counter means and a clocking input of said second counter means for inhibiting or allowing clocking therethrough of said second counter means by said second adjustable frequency oscillation means.

4,595,849

SMALL A.C. MOTOR HAVING AN OSCILLATORY PERMANENT MAGNET ARMATURE

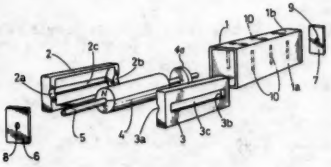
Gérard Cuénoud, Grand Lancy, Switzerland, assignor to Les Produits Associes LPA SA, Switzerland

Continuation of Ser. No. 420,298, Sep. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 243,902, Feb. 27, 1981, abandoned. This application Jun. 13, 1985, Ser. No. 744,642

Claims priority, application Switzerland, Jul. 11, 1979, 6449/79

Int. Cl.[4] H02K *33/00*

U.S. Cl. 310—36 **17 Claims**



1. A small a.c. motor energized from a.c. supply and having an oscillating permanent magnet armature, in particular for the oscillating drive of a hand held appliance attached to the armature shaft, with a cylindrical diametrically magnetized permanent magnet as an armature and having a stationary coil, characterized in that the coil is orientated with its magnetic axis perpendicular to the longitudinal axis of the armature and surrounds the permanent magnet where its turns run essentially rectangularly, and that the stator is a tubular part of the case, coaxial with the axis of the armature and of magnetizable material, which encloses the coil; said armature having a rest position which is determined by a spring motion, said armature and spring forming an oscillatory system having a natural oscillatory frequency which is slightly lower than the a.c. supply frequency.

4,595,850

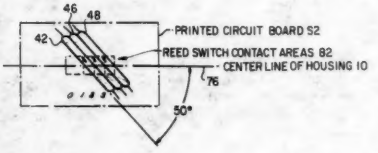
VARIABLE TORQUE MOTOR FOR HYGIENIC APPARATUS

Philippe Guy E. Woog, Vesenaz, Switzerland, assignor to Les Produits Associes LPA SA, Geneva, Switzerland

Continuation-in-part of Ser. No. 577,199, Feb. 6, 1984, abandoned. This application Oct. 25, 1984, Ser. No. 664,614

Int. Cl.[4] H02K *7/14*

U.S. Cl. 310—47 **8 Claims**



1. An electric hygienic device operated from an a.c. electric supply having a frequency comprising:

a tubular housing with a longitudinal axis;

an electric motor disposed within said housing with a shaft which oscillates at an operative angle, the rate of oscillation of the shaft being dependent only on said frequency; and

a switch assembly for varying said operative angle by varying the power supplied to said motor, said switch assembly including;

a switching element slidably mounted on said housing for movement in parallel with said longitudinal axis and including a magnet; and

a plurality of reed switches disposed within said housing, said reed switches each having a major axis, said reed switches being positioned adjacent to each other with said axes in parallel, and at an angle of 40°–70° with respect to said longitudinal axis said switching element being constructed and arranged to selectively activate said reed switches as it moves.

4,595,851

COMMUTATOR MOTOR AND IMPROVED BRUSH CONSTRUCTION FOR USE IN PORTABLE MACHINE TOOLS

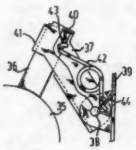
Jan P. Houben, Lv Breda, and Antonie J. Moolenaar, An Dorst, both of Netherlands, assignors to Skil Nederland B.V., Breda, Netherlands

Division of Ser. No. 467,665, Feb. 18, 1983, Pat. No. 4,539,500. This application Oct. 26, 1984, Ser. No. 664,975

Claims priority, application Netherlands, Feb. 18, 1982, 8200652

Int. Cl.⁴ H02K *13/10*; H01R *39/38*

U.S. Cl. 310—246 **9 Claims**



1. An electric motor comprising

a housing,

a stator winding located in said housing,

a rotor shaft carrying a rotor journaled in said housing,

a commutator ring carried by said rotor shaft,

brushes arranged in diametrically opposed brush pairs, said brushes positioned in said housing and cooperating with said commutator ring,

each said brush having a recess and being arranged in a holder,

each said holder being pivotable with respect to said housing at a first end,

each said holder being provided with at least one stop at a second end opposite said pivotable end,

spring means for keeping each said brush in engagement with said stop and for biasing said holder toward said commutator ring, and

one end of said spring means being located in said brush recess.

4,595,852

ELECTROSTATIC GENERATOR

Robert W. Gundlach, 2434 Turk Hill Rd., Victor, N.Y. 14564

Filed Apr. 11, 1984, Ser. No. 599,199

Int. Cl.⁴ H02N *1/00*

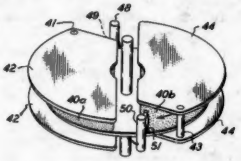
U.S. Cl. 310—309 **5 Claims**

1. A spontaneous non-frictional electrostatic induction-type generator, comprising:

(a) two Faraday cages:

(b) electrode means, substantially surrounded by and mounted for rotary movement relative to said Faraday cages in order to enable said Faraday cages to serve alternately as both the inductor and collector electrodes: and

(c) flexible contact means comprising a single set of brushes mounted to said rotary electrode means so as to extend by



centrifugal force into electrical contact with said Faraday cages, then, after separating from each cage by more than the sparking distance, momentarily contacting each said flexible contact means to ground or to opposite ends of a conductor connecting said flexible contact means to each other to progressively charge said Faraday cages.

4,595,853

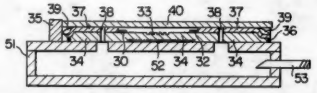
APPARATUS FOR AND METHOD OF DETERMINING PROPERTIES OF SAW SUBSTRATES

Kazuyuki Nagatsuma, Hachioji; Yukio Ito, Sayama; Hirosi Takeuchi, Matsudo; Sakichi Ashida, Fuchu, and Shigeru Jyomura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,815

Int. Cl.⁴ H01L *41/04*

U.S. Cl. 310—313 D **19 Claims**



1. An apparatus for non-destructively determining properties of a surface acoustic wave (SAW) substrate, comprising:

a first interdigital transducer for converting an electrical signal to a surface acoustic wave (SAW) signal and a second interdigital transducer for converting a SAW signal to an electric signal, said first and second transducers having piezoelectric substrates and being a predetermined distance spaced apart from each other;

means for releasably holding a to-be-determined SAW substrate so that said piezoelectric substrates of said first and second interdigital transducers at least partially overlap said to-be-determined SAW saubstrate with a spacing therebetween for co-directional mode coupling of an acoustic wave signal from the piezoelectric substrate of said first transducer with said to-be-determined SAW substrate and from said to-be-determined SAW substrate with the piezoelectric substrte of said second transducer so as to enable non-destructive determination of the properties of said to-be-determined SAW substrate: and

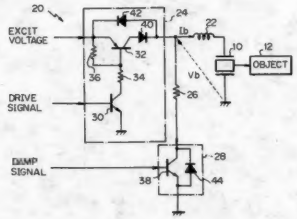
means provided between said first and second transducers for preventing that portion of the acoustic wave signal produced by said first transducer which does not propagate in said to-be-determined SAW substrate from reaching said second transducer.

4,595,854

DRIVE CIRCUIT FOR PIEZOELECTRIC STACK

Takeshi Yano; Shinichi Hori; Izumu Fukui; Eiichi Sato, and Osamu Inui, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,816
Claims priority, application Japan, Apr. 25, 1983, 58-72372
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—317 19 Claims



1. A drive circuit for piezoelectric stack, comprising:

a piezoelectric stack connected to a reciprocating mechanical object and generating a dimensional strain in response to an excitation voltage appliec across electrodes of said piezoelectric stack to drive said object in a reciprocating motion;

a winding connected in series with one of said electrodes of said piezoelectric stack;

switch means for applying the excitation voltage to the piezoelectric stack via said winding in response to a drive signal which is representative of an application timing of the excitation voltage; and

feedback means connected in parallel to the switch means for bypassing around the switch means any reverse polarity current which develops at the output of said switch means.

4,595,855

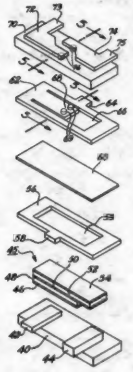
SYNCHRONOUSLY OPERABLE ELECTRICAL CURRENT SWITCHING APPARATUS

George A. Farrall, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,881
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—332 25 Claims

1. A synchronously operable electrical current switching apparatus for switching an electrical load, said apparatus comprising:

a controllable piezoelectric relay having movable electrical contacts and exhibiting conductive and nonconductive states of electrical connectivity between said contacts, said relay including a support structive, a piezoelectric bender affixed to said support structure so that application of an electrical signal to said bender causes deflection of at least a portion of the length of said bender, at least one pair of said movable electrical contacts, with at least one of said contacts being movable so that said contacts exhibit open and closed positions corresponding to said nonconductive and conductive states of electrical connectivity, respectively, said contacts being disposed so that said deflection of said bender causes a change between said open and closed positions of said contacts, said contacts being further disposed so that, with said contacts in said open position, the distance therebetween is sufficient that the breakdown voltage between said contacts is greater than the maximum operating voltage of the load being switched by said switching apparatus, with said distance also being sufficiently small, and with said movable contact and associated bender having sufficient small mass, that said movable contact is movable between said closed and open positions in a time period sufficiently small that said state of



electrical connectivity is changeable while the load current through said contacts is substantially zero;

means for controlling said relay so as to effect a change of state of said electrical connectivity, through motion of said contacts, by selectively applying said electrical signal to said bender; and

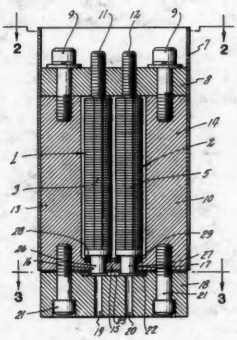
means for operating said controlling means so as to substantially reduce arcing between said contacts.

4,595,856

PIEZOELECTRIC FLUIDIC POWER SUPPLY

Walter L. Glomb, Jr., Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 16, 1985, Ser. No. 766,236
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—339 4 Claims



1. A piezoelectric, fluidic power supply for extracting elec-

tric power from a pressurized fluid, said power supply being characterized by:

a piezoelectric power generating device generating electric power by reciprocation of a movable end thereof in response to fluidic oscillations applied thereto;

a piezoelectric cycle control device generating perodic fluidic oscillations by reciprocation of a movable end thereof in response to period oscillations in electric power applied to said control device;

means for electrically connecting said piezoelectric devices in a circuit for providing said electric power from said power generating device to said control device;

means for fluidically connecting said movable ends for the fluidic conduction of said fluidic oscillations from said control device to said power generating device;

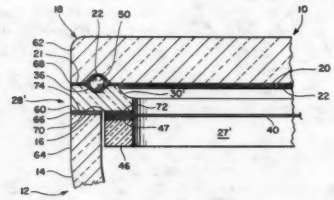
whereby said fluidically and electrically connected devices define a closed loop oscillator wherein periodic oscillations in fluid pressure generate and are induced by periodic oscillations in electric power flow.

4,595,857

TENSION MASK COLOR CATHODE RAY TUBE APPARATUS

William A. Rowe, Palatine, and Paul Strauss, Chicago, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 18, 1984, Ser. No. 572,089
Int. Cl.[4] H01J *29/82, 29/81*
U.S. Cl. 313—407 **12 Claims**



1. A color cathode ray tube comprising:

an envelope funnel having a central axis and including a bell portion, one extremity of which has a predetermined wall thickness, said extremity further comprising a sealing land;

a face panel comprising a part of the CRT envelope and having a target surface with a pattern of luminescent primary color elemental phosphor areas deposited thereon and a sealing land circumscribing said target surface, said face panel having registration affording means selectively located and oriented thereon;

a color selection electrode assembly permitting selective excitation of said phosphor areas by a scanning beam of electrons comprising;

a tensed foil having a predetermined pattern of apertures,

an insulating frame defining a central opening dimensioned to enclose said target surface of said face panel;

said frame comprising a pair of spaced-apart surfaces, one of which comprises a foil mounting surface while the other comprises a sealing land surface disposed in a confronting relation to said face panel sealing land,

said foil mounting surface of said frame having an overall external span which is less than the span of said face panel by at least the wall thickness of said one extremity of said funnel bell portion,

said foil having its peripheral portion frit bonded to said frame foil mounting surface,

indexing means associated with said frame sealing land and cooperable with said face panel registration affording means to permit precise registration between said frame mounted foil and said face panel and

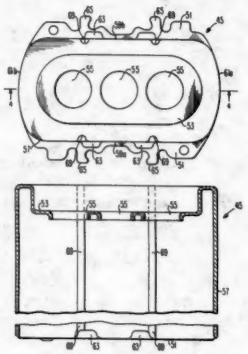
frit means for bonding said funnel, said frame and said face panel together with said foil wholly enclosed within said funnel bell portion and with said foil aperture pattern in registration with said pattern of elemental phosphor areas.

4,595,858

REINFORCING MEANS FOR A CUP-SHAPED ELECTRON GUN ELECTRODE

John R. Hale, East Hempfield Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 3, 1984, Ser. No. 677,529
Int. Cl.[4] H01J *29/58, 29/82*
U.S. Cl. 313—414 **5 Claims**



1. In an electron gun assembly for use in a cathode-ray tube, said gun assembly including a beam forming region and a main focus lens for generating and directing a plurality of electron beams along spaced, co-planar beam paths, said beam forming region and said main focus lens being longitudinally spaced along a plurality of insulative support means, said main focus lens including at least one substantially cup-shaped member having a base portion adjacent to one end, a supporting flange portion substantially parallel to the base portion at the oppositely disposed other end and a sidewall extending therebetween, said supporting flange portion including attachment means to facilitate securing said member to said insulative support means, the improvement wherein

said sidewall includes a plurality of reinforcing ribs formed therein and extending longitudinally substantially from said one end adjacent to said base portion to said supporting flange portion at the oppositely disposed other end to minimize flexure of said sidewall resulting from securing said member to said insulative support means thereby maintaining the parallelism of said base portion and said supporting flange portion.

4,595,859

HALOGEN INCANDESCENT LAMP AND SOCKET COMBINATION, PARTICULARLY FOR DIRECT ASSEMBLY INTO A FIXTURE WITH BAYONET LOCK

Hermann Steiner, Herbrechtingen; Walter Schönherr, Giengen-Hürben, and Peter Helbig, Sontheim, all of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,938
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 8311269[U]
Int. Cl.[4] H01K *1/42*
U.S. Cl. 313—579 **12 Claims**

1. An integrally formed, unitary lamp socket in combination

with a halogen incandescent lamp (1) wherein the halogen incandescent lamp has

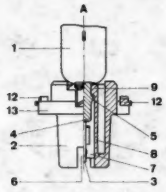
a base (4) formed as a glass press which includes, at least in part, a flat plate-like portion;

at least one extending projection (5) formed on, and extending transversely to the longitudinal axis (A) of, the base press (4) to define a locating, positioning and holding projection; and

electrical terminal leads (3) extending from the base (4); and, wherein the socket includes an essentially cylindrical element (2) formed with a recess (6) therein shaped to receive, through an opening defining one end of said recess, the base (4) of the lamp, and the terminal leads (3) projecting therefrom;

and further comprising,

a pair of oppositely positioned, resiliently deflectable separating walls (8) located in the recess (6) of the socket, defining essentially rectangular chords through said cylin-



drical element (2), and secured thereto, and resiliently engaging opposite flat sides of the plate-like portion of the base (4) of the lamp;

a supporting flange (13) formed with and circumferentially projecting from said cylindrical element (2) and adapted for direct mounting of said lamp-socket combination in any desired plate-like structure (P); and

an engagement edge (9), formed on at least one of said separating walls (8), located and shaped with a surface extending perpendicular to the longitudinal axis (A) of said lamp press (4) for positive engagement over the holding projection (5) on the base (4) of the lamp, for positioning the lamp in the socket, holding the lamp in position, and preventing unintended axial movement of the lamp from the socket after insertion of the lamp in the socket, and for resilient snap-in of the engagement edge (9) over the holding projection (5) on the base (4) of the lamp.

4,595,860

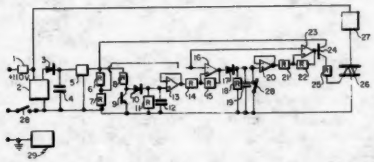
AUTOMATIC INDOOR LAMP UNIT

Mark O. Taylor, 20811 Marine View Dr., S.W., Seattle, Wash. 98166

Filed May 24, 1984, Ser. No. 613,575

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—158 **1 Claim**



1. An indoor lamp and electronic circuit unit comprising:

a. a means of switching from OFF to ON of said lamps light in response to a local ambient light level via a photo-sensitive device and electronic circuitry,

b. a means via electronic circuitry to ensure operation of said lamp unit in only one of two states fully ON or OFF,

c. subsequent of an OFF to ON transition of said lamp units two states of operation a means to sustain the ON state of operation for a specified period of time via electronic circuitry, the ON state is sustained regardless of the ambient light level detected by the said photo-sensitive devise,

d. a means of turning to OFF state of said lamp unit automatically subsequent to passing of said specified period of time via electronic circuitry,

e. a means of turning to ON state of said lamp unit subsequent to transition from ON to OFF state of operation in response to an ambient light level detected by said photo-sensitive device,

f. a means to manually operate said lamp unit continuously in either the OFF state or the ON state regardless of the ambient level detected by said photo-sensitive device.

4,595,861

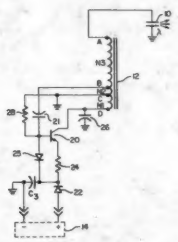
POWER SUPPLIES FOR ELECTROLUMINESCENT PANELS

Nicholas T. Simopoulos; George N. Simopoulos, and Gregory N. Simopoulos, all of Dayton, Ohio, assignors to Luminescent Electronics, Inc., Dayton, Ohio

Filed Jul. 30, 1984, Ser. No. 635,770

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—169.3 **10 Claims**



1. A drive circuit for an electroluminescent panel or the like defining a capacitive load, said drive circuit operating from a low voltage source of DC power and comprising:

an autotransformer having a plurality of windings defined by taps along said autotransformer and including a voltage step-up winding for driving connection to said electroluminescent panel; and

oscillator means connected to said low voltage source and comprising at least one transistor connected to associated windings of said autotransformer, the oscillation of said oscillator means being responsive to the reflected capacitance of said electroluminescent panel such that said oscillator means is detuned by a short circuit of said electroluminescent panel and will no longer oscillate.

4,595,862

GRAPHIC FLUORESCENT DISPLAY DEVICE

Kiyoshi Morimoto; Hiroshi Watanabe; Yoshihisa Tsuruoka, and Yukihiko Shimizu, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Sep. 28, 1984, Ser. No. 655,456

Claims priority, application Japan, Sep. 30, 1983, 58-152804[U]

Int. Cl.[4] G09G *3/10*

U.S. Cl. 315—169.4 **4 Claims**

1. A graphic fluorescent display device comprising:

a substrate formed of an insulating material;

a plurality of phosphor-coated anodes arranged in parallel with one another on said substrate;

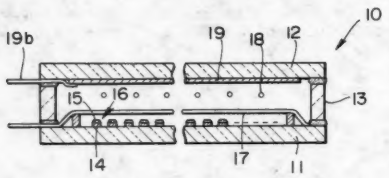
a plurality of linear control electrodes arranged in a manner to be spaced from said anodes and in the direction across said anodes;

a cathode means stretched above said control electrodes;

the region on each of said anodes controlled by adjacent at

least two of said control electrodes forming one picture cell; and

an electric field controlling electrode arranged opposite to



said anodes with said control electrodes and cathode means being interposed between said anodes and said electric field controlling electrode, to which potential positive with respect to said cathode means is applied.

4,595,863

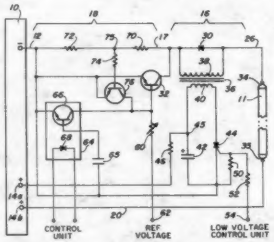
D.C. LUMINOUS TUBE SYSTEM

Haden V. Henning, Arlington, Tex., assignor to Lightmasters, Ltd., Dallas, Tex.

Filed Oct. 26, 1983, Ser. No. 545,639

Int. Cl.[4] H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—208 **6 Claims**



1. A luminous gas filled tube system, comprising:

(a) a direct current power source connected in series with the luminous tube, said power source having a voltage less than the ionization potential of the gas but providing current through the tube when the gas is ionized;

(b) a tube starter circuit, including:

(1) a transformer having its secondary winding connected in series with the tube and said power source;

(2) a storage capacitor connected to said power source and the primary winding of said transformer;

(3) pulse means for selectively discharging said capacitor through said primary winding to produce a high voltage pulse in said secondary winding, said high voltage pulse combining with the voltage provided by said power source to thereby ionize the gas in the tube;

(c) a tube controller circuit, including:

(1) a series transistor having its emitter-collector path connected in series with said tube, said power source, and said secondary winding of said transformer;

(2) control means connected to the base of said series transistor for adjusting the flow of current through the emitter-collector of said series transistor; and

(3) optocoupler means connected to said power source and the base of said series transistor for selectively interrupting current flow through the emitter-collector of said series transistor, thereby permitting the gas in the tube to deionize and extinguish the luminous tube.

4,595,864

METHOD OF GENERATING CURRENT PULSES FOR OPERATING A LIGHT-EMITTING DIODE AND CIRCUIT ARRANGEMENT FOR CARRYING OUT THE METHOD

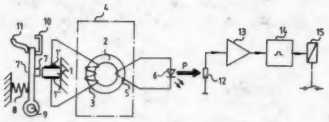
Günther Stiefelmeyer, Bissingen-Teck, and Konrad Langbein, Dettingen-Teck, both of Fed. Rep. of Germany, assignors to Leuze Electronic GmbH & Co., Owen-Teck, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,532

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303404; Jun. 28, 1983, 3323243

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—246 **10 Claims**



1. A device for actuating a light-emitting diode, comprising a piezoelectric body having two electrodes; means for mechanically striking said piezoelectric body; a pulse transformer having its primary winding directly connected to said electrodes and a secondary winding directly connected to a light-emitting diode to generate a current pulse energizing said light emitting diode when said mechanical striking means is operated.

4,595,865

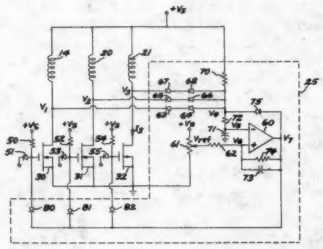
CURRENT-SENSING SCHEME FOR SWITCHED RELUCTANCE MOTOR DRIVES

Thomas M. Jahns, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,368

Int. Cl.[4] H02P *6/02*

U.S. Cl. 318—254 **34 Claims**



1. A current regulator for limiting phase current amplitudes in a multiphase motor drive employing unidirectional current excitation from a DC source, each phase of said motor drive including a phase winding for connecting in series with a respective semiconductor switch, said regulator comprising:

a comparator having a noninverting input, an inverting input and an output, said comparator generating a low logic level output signal when any instantaneous phase current exceeds a regulated current limit;

sensor means coupled to said inverting input and adapted to be coupled to said semiconductor switches for providing voltage signals, each of said voltage signals being proportional to the instantaneous phase current of a respective phase;

voltage-reference means coupled to said noninverting input

for providing a reference signal proportional to said regulated current limit;

anti-latching means coupled to said comparator and to said sensor means for decoupling said inverting input from said sensor means when said comparator generates a low level output signal;

delay means coupled to said comparator for reducing said reference signal for a predetermined time after each transition to a low level output signal by said comparator output; and

turn-off means coupled to said comparator output and adapted to be coupled to said semiconductor switches for turning off said semiconductor switches when said comparator generates a low level output signal;

whereby the conduction intervals of said semiconductor switches are pulse-width modulated to regulate the amplitudes of said phase currents.

4,595,866

WINDSHIELD WIPER CONTROL APPARATUS

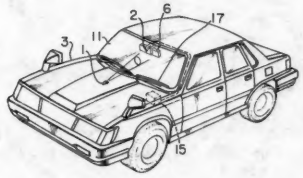
Yoshiaki Fukatsu, Nagoya; Takashi Kurahashi, Aichi, and Kazuma Matsui, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 26, 1984, Ser. No. 665,157

Claims priority, application Japan, Oct. 27, 1983, 58-202426; Oct. 27, 1983, 58-202427; Oct. 27, 1983, 58-202428

Int. Cl.[4] B60S *1/08*; H02P *1/04*

U.S. Cl. 318—444 **3 Claims**



1. A windshield wiper control apparatus for use on a vehicle having an occupant compartment with a windshield and a windshield wiper device having a wiper blade movable across a predetermined area of the windshield, comprising:

a first unit adapted to be mounted on the vehicle outside said occupant compartment for emitting an infrared beam to and through said predetermined area of the windshield into said occupant compartment;

a second unit adapted to be mounted on the vehicle in said occupant compartment for receiving rays of the infrared beam from said first unit through said predetermined area of said windshield; and

means for automatically controlling the wiper operation in dependence on the state in which the infrared rays are received by said second unit;

said second unit including an infrared transmission plate carrying infrared shielding layers applied to at least one of the two surfaces of said plate and photodetector means disposed rearwardly of said infrared transmission plate as viewed in the direction of the passage of the infrared beam,

said infrared transmission plate being formed of a material capable of transmitting infrared rays,

said infrared shielding layers being formed from a material capable of substantially obstructing the passage of infrared rays therethrough whereby a contrast is produced on said photodetector means by the infrared rays which have passed through the zones of said infrared transmission plate which are free from said infrared shielding layers, the contrast being varied with the variation in the quantity of raindrops on said predetermined area of said windshield,

said controlling means being responsive to the variation in the contrast to control the operation of the wiper blade,

wherein said first unit comprises an outer casing, an inner casing having a perforated wall, a light-emitting element in said inner casing, a lens disposed at an open end of said inner casing, said perforated wall of said inner casing having a lining of a water-absorbing material extending over the perforated surface of said inner casing wall, said outer casing having a portion disposed in optical alignment with said lens and capable of transmitting the light emitted by said light-emitting element and coming from said lens, and heating means operable to heat said light transmitting portion of said outer casing.

4,595,867

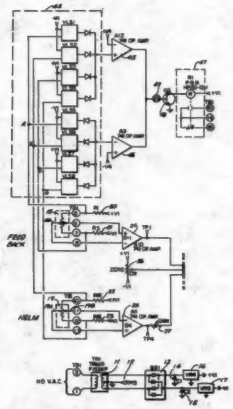
STEERING AMPLIFIER

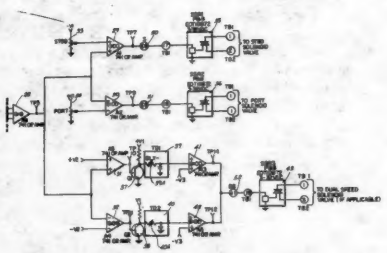
Kenneth J. Cognevich, Sr., River Ridge, and Joseph E. Robichaux, Jr., Arabi, both of La., assignors to Engine Monitor, Inc.

Continuation of Ser. No. 535,686, Sep. 26, 1983, abandoned. This application Jul. 15, 1985, Ser. No. 755,268

Int. Cl.[4] B63H *25/02*; G05D *1/00*

U.S. Cl. 318—588 **3 Claims**





1. A steering amplifier for a vessel having a helm, a rudder and a rudder positioning means, comprising:

a helm potentiometer to indicate the helm position;

a feedback potentiometer to indicate the rudder position;

means for determining the difference between the helm potentiometer position and the feedback potentiometer position and producing a signal indicative thereof;

means for controlling the rudder positioning means in response to the difference signal;

means responsive to an open or short circuit condition in the helm potentiometer for indicating an ahead position for the helm control to the difference means; and

means responsive to an open or short circuit condition in the feedback potentiometer for indicating an ahead position for the rudder to the difference means.

4,595,868

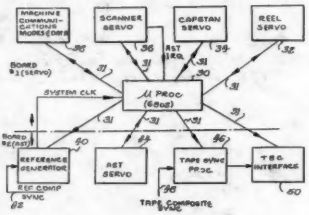
PHASE DETECTOR CONTROL FOR A SERVO SYSTEM

Kenneth Louth, Menlo Park Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 608,268, May 7, 1984, abandoned, which is a continuation of Ser. No. 364,964, Apr. 2, 1982, abandoned. This application Feb. 27, 1985, Ser. No. 707,161

Int. Cl.[4] G05B *11/01*

U.S. Cl. 318—608 **18 Claims**



1. Apparatus for providing phase detection and control of a variable were the phase is discretely measured, comprising:

means for providing a system clock for said apparatus;

means for latching the level of a two level reference signal applied thereto, in response to said system clock signal being applied;

means for latching the level of a two level feedback signal applied thereto from the controlled variable in response to said system clock being applied;

a digital counting means adapted to be selectively incremented or decremented in response to clock signal being applied when said counting means is enabled by an enable line, the incrementing or decrementing being determined by a control line;

digital-to-analog converting means connected to said counting means for providing an analog output signal that is proportional to the value of the count contained in said counting means;

circuit means interposed between and connected to said latching means and said counting means for controlling said control line and enable line, said means including feedback and reference direction input lines, said means disabling said enable line when reference and feedback latching means are simultaneously active and controlling said control line to have the system clock decrement or increment said counting means when only one of said latching means is active, said means automatically controlling said control line to properly increment or decrement said counting means even when the direction of said feedback and reference are changed.

4,595,869

SOLID STATE ELECTRICAL CONTROL FOR A REVERSIBLY MOVABLE MEMBER

Joseph A. Armond, River Grove, Ill., assignor to Electro-Matic Products Company, Chicago, Ill.

Filed Apr. 24, 1984, Ser. No. 603,357

Int. Cl.[4] G05G *5/00*

U.S. Cl. 318—626 **2 Claims**

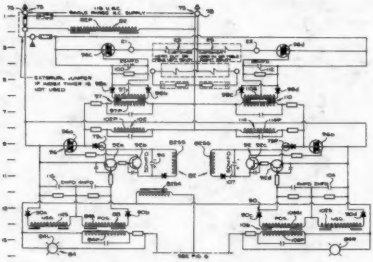
1. Apparatus for controlling the movements of a reversely movable member through a full range of movement, of the kind that includes a reversible electrical drive means having input terminals, a traverse unit and a remote unit, the traverse unit including a pair of traverse coils corresponding to the respective ends of said range of movement, and traverse armatures in the coils respectively oppositely and simultaneously movable into and out of the coils in response to the opposite movements of the movable member,

the remote unit including a pair of remote coils respectively serially connected to the coils of the traverse unit and remote armatures therein individually manually adjustable and settable,

the traverse armatures being operable for producing varied induced voltage in the traverse coils, and the remote armatures, in response to their setting, being operable for establishing limits of the values of the voltages so produced,

the apparatus comprising,

control apparatus operable in response to the voltage in the traverse coils, reaching a predetermined value, for transmitting current respectively in opposite directions through said input terminals and thereby through the drive means,



first triacs respectively connected with said input terminals,

the apparatus incorporates a main circuit including right and left halves, each half circuit including a respective one of said triacs, and means responsive to energizing one-half circuit for providing a counter voltage on the other half for preventing simultaneous energization of both halves,

an SCR in each half circuit,

means responsive to movement of the movable member in each direction for developing DC and imposing it on the respective SCR and thereby energizing the respective half circuit,

means for producing DC in movement of the movable member in each direction, of respectively opposed polarity, and capacitor means for storing the DC, and

triggering means responsive to the movable member reaching its limit of movement in each direction for discharging the capacitor means and energizing the corresponding half circuit and reversing the direction of movement of the movable chamber.

4,595,870

LINEAR MOTOR

Anwar Chitayat, Northport, N.Y., assignor to Anorad Corporation

Filed Aug. 7, 1984, Ser. No. 638,489

Int. Cl.[4] G05B *11/00*

U.S. Cl. 318—687 **16 Claims**

1. A linear motor system comprising:

a linear motor;

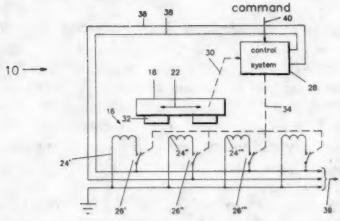
said linear motor including a stator and a movable element;

said stator including a plurality of coils wound thereon effective for producing a plurality of magnetic poles having alternating magnetic polarities;

said movable element including at least one permanent magnet having at least one permanent magnetic pole facing said stator;

means for sensing first and second phase positions of said at least one permanent magnetic pole with respect to said plurality of magnetic poles;

means for enabling a subset of said plurality of coils within a substantial magnetic influence of said at least one pemanent magnetic pole; and



means in said control system responsive at least to said phase positions for producing a first driving signal for application to alternate ones of said enabled coils and a second driving signal for application to a remainder of said enabled coils, said first and second driving signals having polarities and amplitudes effective for applying a desired force to said movable element.

4,595,871

STEPPING MOTOR OF HYBRID MULTI-PHASE TYPE AND DEVICE FOR ITS CONTROL

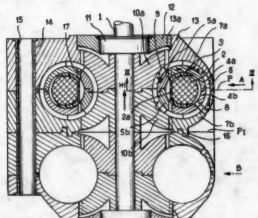
Gérard Koehler, Ville D'Avray, France, assignor to La Telemecanique Electrique, Nanterre, France

Filed Nov. 6, 1984, Ser. No. 668,826

Claims priority, application France, Nov. 16, 1983, 83 18187; European Pat. Off., Oct. 12, 1984, 84 402 058.6

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **14 Claims**



1. Stepping motor of the hybrid multi-phase type, comprising a primary element such as a stator which comprises one winding (**2**, **22**, **42***a*, **42***b*, **42***c*, **62**, **82**) per phase (A, B), a secondary element which is displaceable with respect to the primary element and a permanent magnet (**9**, **29**, **49**, **69**, **89**) the pole faces of which are equipped with two pole pieces (**5***a*, **5***b*; **10***a*, **10***b*; **25**, **30**; **45**, **50**; **65**, **70**, **85**, **90**) the ends of which define gaps with the rest of the magnetic circuit in such a manner that, for certain relative positions of the primary and secondary elements a closed magnetic circuit is achieved which comprises the permanent magnet and two closed gaps, wherein it comprises, per phase, a second permanent magnet (**6**, **26**, **46**, **66**, **86***a*, **86***b*) which is also equipped on its pole faces with two pole pieces (**4***a*, **4***b*; **7***a*, **7***b*; **24**, **27**; **44**, **47**; **64**, **67**; **84**, **87**) the ends of which define gaps with the ends of the pole pieces (**5***a*, **5***b*; **10***a*, **10***b*; **25**, **30**; **45**, **50**; **65**, **70**, **85**, **90**) of the first permanent magnet (**9**, **29**, **49**, **69**, **89**) in such a manner that one permanent magnet is in the primary element and another in the secondary element, each gap thus being flanked by two permanent magnets, one of which (**6**, **26**, **46**, **66**, **86***a*, **86***b*) is mobile and the other one (**9**, **29**, **49**, **69**, **89**) fixed, one upstream of the flux circulation and the other one downstream, and in that this second permanent magnet (**6**, **26**, **46**, **66**, **86***a*, **86***b*) is oriented in such a manner that the field (H1) of the winding (**2**, **22**, **42***a*, **42***b*, **42***c*, **62**, **82**) of the corresponding phase is perpendicular to the direction of its magnetization and directed towards one or the other of the ends of each of its pole pieces (**4***a*, **4***b*; **7***a*, **7***b*; **24**, **27**; **44**, **47**; **64**, **67**; **84**, **87**) defining the gaps, in such a manner as to create a flux transfer device.

4,595,872

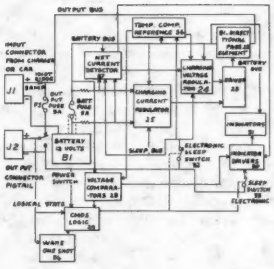
COMPUTER-ATTACHED UNINTERRUPTABLE DC POWER SUPPLY

Newton E. Ball, 5625 Kearny Villa Rd., San Diego, Calif. 92123

Continuation-in-part of Ser. No. 536,752, Sep. 28, 1983. This application Mar. 28, 1985, Ser. No. 716,907

Int. Cl.[4] H02J *7/00, 9/00*

U.S. Cl. 320—13 **10 Claims**



1. In combination with an electronic device operable from a DC-voltage source, an apparatus for maintaining the operation of the device in case of failure or temporary absence of the DC-voltage source, which comprises:

a rechargeable battery having a nominal output voltage substantially equivalent to the DC voltage source;

means for controlling the charging of the battery from the DC voltage source;

means for regulating the discharge of the battery into the device;

means for indicating the charge and discharge state of the battery;

means for sensing the states of the DC voltage source;

means responsive to said means for sensing, for disabling said means for controlling and said means for indicating in the absence or failure of the DC-voltage source when either said apparatus is electrically disconnected from said device, or the voltage of said battery drops below a set value, in order to minimize the current drain from the battery; and

means responsive to said means for sensing, for reactivating said means for controlling and said means for indicating when the presense of the DC-voltage source is restored.

4,595,873

CIRCUIT ARRANGEMENT FOR FEEDING ELECTRICAL USERS WITH A DC VOLTAGE

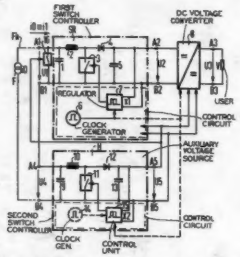
Gerhard Musil, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,127

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425929

Int. Cl.[4] H02M *3/156*

U.S. Cl. 323—222 **11 Claims**



1. A circuit arrangement for feeding electrical users with a DC voltage, comprising:

a first switch controller means for connecting at least one user to a feed circuit fed with an impressed current;

said first switch controller means having at least one switch element controllable by a control circuit means supplied from an auxiliary voltage source;

said control circuit means controlling the switch element dependent on a DC voltage at an output of said first switch controller means which is to be kept at least approximately constant;

the auxiliary voltage source comprising a second switch controller means having a switch element parallel to an input thereof;

a diode between the switch element and a capacitor parallel to an output of the second switch controller means, said diode being poled such that the diode is inhibited given a conductive switch element; and

the first and second switch controller means being connected in series with one another at their inputs.

4,595,874

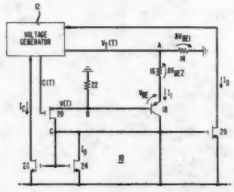
TEMPERATURE INSENSITIVE CMOS PRECISION CURRENT SOURCE

Jerrell P. Hein, Longswamp Township, Berks County, and Navdeep S. Sooch, Emmaus, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 26, 1984, Ser. No. 654,411

Int. Cl.[4] G05F *3/16*

U.S. Cl. 323—312 **7 Claims**



1. A CMOS circuit (10) for providing a constant current (I_o) output, said CMOS circuit comprising

means for generating a temperature dependent voltage (V(T) wherein the temperature dependency is linear of the form $y=m_yx+b_bm_y$ being defined as a voltage temperature coefficient and b_y being defined as a reference voltage (V_{ref});

a temperature dependent on-chip resistance (R(T)) wherein the associated temperature dependency is of the form $y=m_yx+b_bm_y$ being defined as a voltage temperature coefficient and b_y being defined as a reference voltage (V_{ref});

a temperature dependent on-chip resistance (R(T)) wherein the associated temperature dependency is of the form $y=m_Rx+b_Rm_R$ being defined as an on-chip resistance temperature coefficient and b_R being defined as a reference value (R_o) of said on-chip resistance at a predetermined reference temperature (T_o), said temperature dependent voltage means and said temperature dependent on-chip resistance being related such that $m_R/m_Y=b_R/b_y$=constant; and

output means (20) responsive to both said temperature dependent voltage means and said temperature dependent on-chip resistance for providing said constant current as an output of said CMOS circuit where said constant current is equal to the value of said temperature dependent voltage means divided by the value of said on-chip resistance.

4,595,875

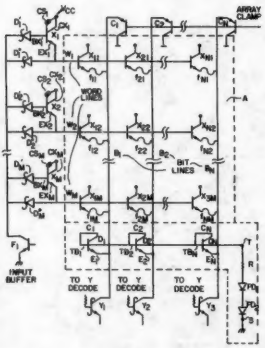
SHORT DETECTOR FOR PROMS

Albert Chan; Mark Fitzpatrick, both of San Jose; Don Goddard, Cupertino; Robert J. Bosnyak, Los Gatos, and Cyrus Tsui, San Jose, all of Calif., assignors to Monolithic Memories, Incorporated, Santa Clara, Calif.

Filed Dec. 22, 1983, Ser. No. 564,642

Int. Cl.[4] G01R *15/12*

U.S. Cl. 324—73 PC **13 Claims**



1. In a semiconductor device comprising at least one programmable cell and at least one bit line, a circuit for detecting shorts or leakage currents comprising:

means for receiving a selected test voltage;

means for receiving a reference voltage;

means, connected between said means for receiving a selected test voltage and each of said bit lines, for applying a predetermined portion of said selected test voltage to each of said bit lines; and

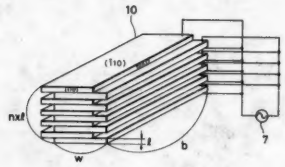
means, connected between each of said bit lines and said means for receiving a reference voltage, for isolating said semiconductor device from said reference voltage when said selected test voltage is not being received.

4,595,876

OPTICAL VOLTAGE AND ELECTRIC FIELD SENSOR

Yoshiki Kuhara; Koji Tada; Masami Tatsumi, all of Osaka, and Yuuji Hamazaki, Kanagawa, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 12, 1982, Ser. No. 397,009
Claims priority, application Japan, Jul. 27, 1981, 56-118257
Int. Cl.[4] G01R *31/00;* G02F *1/03*
U.S. Cl. 324—96 14 Claims



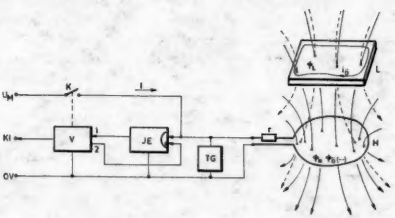
1. An optical voltage and electric field sensor composed of a plurality of single crystal plates of $Bi_{12}XO_{20}$ each having a thin thickness in a direction of $<\bar{1}\,1\,0>$ wherein X is selected from a group consisting of Si or Ge, comprising: said plates being stacked in a direction of $<\bar{1}\,1\,0>$ and in parallel with the direction of incident light, and the voltage or the electric field to be detected being applied to said stacked plates in a direction of $<\bar{1}\,1\,0>$ which direction is vertical to the direction of incident light.

4,595,877

INDUCTIVE LOOP SYSTEM FOR DETECTION OF AN ELECTRICALLY CONDUCTIVE OBJECT

Károly Dülk, Budapest, Hungary, assignor to Vilati Villamos Automatika Fovallalkozo es Gyarto Vallalat, Budapest, Hungary

Division of Ser. No. 393,302, Jun. 29, 1982, abandoned. This application Oct. 18, 1984, Ser. No. 662,263
Claims priority, application Hungary, Aug. 3, 1981, 2248/81
Int. Cl.[4] G08G *1/01;* G01N *27/72;* G01V *3/11*
U.S. Cl. 324—239 8 Claims



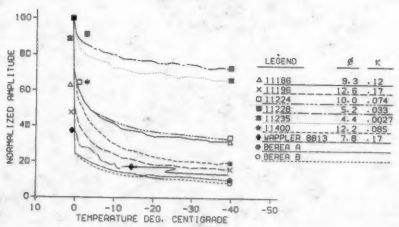
1. Circuit arrangement for the detection of an electrically conductive object by means of a conductive loop, comprising loop means forming an exciting loop and a measuring loop, a direct current voltage source and a switching element, one terminal of which is connected to the direct current voltage source wherein the exciting loop is connected to the direct current voltage source through operation of the switching element, a measuring cycle commencing upon operation of said switching element; a shaping-amplifying circuit having an input connected to the loop means for pre-processing and sampling the voltage across the measuring loop, said shaping-amplifying circuit having an inhibiting input to inhibit operation of the shaping-amplifying circuit following closing of the switch until after a self-inductive transient has died out following switch closing, a control circuit for controlling the sequence of operation and functional interrelation of elements of the detection circuit arrangement having an input connected to the output of the shaping-amplifying circuit and an information output, said information output providing a logical signal when indicating the voltage measured by the shaping-amplifying circuit is approximately zero for permitting restart of a measuring cycle; a second output of the control circuit being connected to a control input of the switching element, and a third output of the control circuit being connected to said inhibiting input of the shaping-amplifying circuit.

4,595,878

NMR MEASUREMENT ON FROZEN CORES

Gale T. Bradshaw, Norman, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 418,353, Sep. 15, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,932
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—300 15 Claims



1. A method of analyzing a geological sample taken from a subterranean formation and saturated with fresh water which comprises:

(a) making a nuclear magnetic resonance (NMR) measurement of said sample with said sample at just below the freezing temperature of the fresh water to obtain a first value,

(b) making an NMR measurement on said sample with said sample and the fresh water therein being above the freezing temperature of the fresh water to obtain a second value,

(c) obtaining a ratio of said first and second values.

4,595,879

NUCLEAR MAGNETIC RESONANCE FLOW IMAGING

Arnold H. Lent, Macedonia; Waldo S. Hinshaw, Cleveland Heights, and Russell A. Compton, Chesterland, all of Ohio, assignors to Technicare Corporation, Solon, Ohio

Filed Nov. 14, 1983, Ser. No. 551,244
Int. Cl.[4] G01R *33/24*
U.S. Cl. 324—309 16 Claims

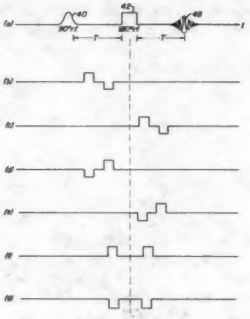
1. A method of acquiring an NMR signal providing motional information of a sample comprising the steps of:

(a) applying an r.f. excitation signal to said sample for the subsequent production of an NMR signal;

(b) applying spatial encoding gradient fields to said sample in a pulse sequence in which the gradient pulse train of a gradient in the direction in which motion is to be encoded exhibits a zero value first moment with respect to the timing of an r.f. excitation signal;

(c) applying a motion encoding gradient field to said sample

to encode motion in a given direction which is produced in response to a two-pulse gradient pulse sequence which



exhibits a zero value zero moment and a non-zero value first moment; and

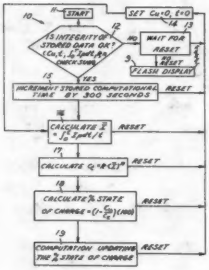
(d) after the above steps, acquiring NMR signal information.

4,595,880

BATTERY STATE OF CHARGE GAUGE

Prabhakar B. Patil, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 8, 1983, Ser. No. 520,967
Int. Cl.[4] G01N 27/46
U.S. Cl. 324—427 **5 Claims**



1. A method for computing the state of charge for a battery including the steps of:

measuring I_p, wherein Ip is the battery discharge current;

determining $\bar{I}$, wherein $\bar{I}$ is the average battery current, by calculating

$$\left(\int_0^t I_p dt \right) / t;$$

empirically determining k and n for the battery, wherein k and n are Puekert constants;

calculating the total capacity, C_t, of the battery using the Puekert equation, $C_t = k \cdot \bar{I}^n$;

reevaluating k, n as a function of temperature and age of the battery;

calculating the used battery capacity, C_u, by integrating battery current with respect to time;

calculating the percent state of charge using $(1 - C_u/C_t)$ (100), and

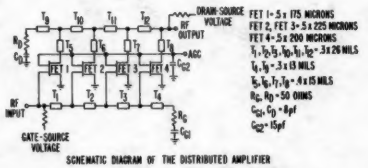
repeating the above steps to determine the state of charge the battery at subsequent times.

4,595,881

DISTRIBUTED AMPLIFIER USING DUAL-GATE GAAS FET'S

Wayne Kennan, Palo Alto, Calif., assignor to Avantek, Inc., Santa Clara, Calif.

Filed May 29, 1985, Ser. No. 738,865
Int. Cl.[4] H03F 3/60
U.S. Cl. 330—54 **4 Claims**


DRAIN-SOURCE VOLTAGE
RF OUTPUT
RF INPUT
AGC
GATE-SOURCE VOLTAGE
FET 1-5 x 175 MICRONS
FET 2, FET 3-5 x 225 MICRONS
FET 4-5 x 200 MICRONS
T1, T2, T3, T9, T11, T12 - 3 x 26 MILS
T4, T8 - 3 x 13 MILS
T5, T6, T7, T10 - 4 x 15 MILS
RC, RD - 50 OHMS
CC1, CD - 8pf
CC2 - 15pf

SCHEMATIC DIAGRAM OF THE DISTRIBUTED AMPLIFIER

1. A distributed amplifier comprising a radio frequency input terminal, a radio frequency output terminal, a circuit ground, an automatic gain control input terminal for receiving a gain control signal, at least a pair of dual gate field effect transistors, each having first and second gate electrodes and source and drain electrodes, a plurality of first inductances connected together in series, one end of the series connection being connected to the input terminal, a first resistor and a first capacitor connected together in series between the circuit ground and the other end of the series connection of the first inductances, a plurality of second inductances connected in series, the series connection of second inductances being connected at one end to the output terminal, a second resistor and a second capacitor connected in series between the circuit ground and the other end of the series connection of the second inductances, a plurality of third inductances, and wherein the source electrodes are connected to the circuit ground, the second gate electrodes are connected to the gain control input, the first gate electrode of a first one of the field effect transistors is connected to the input terminal and the first gate electrodes of the remaining field effect transistors are each connected to the junction connections between different ones of the first inductances, the drain electrode of a last one of the field effect transistors is connected in series with one of the third inductances to the output terminal, and the drain electrodes of the remaining field effect transistors are connected in series with different ones of the third inductances to different junction connections of the series connection of the second inductances.

4,595,882

PHASE ADJUSTED FEEDFORWARD ERROR CORRECTION

Edward G. Silagi, and Marvin W. Heidt, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 30, 1984, Ser. No. 615,500
Int. Cl.[4] H03F 1/26
U.S. Cl. 330—151 **6 Claims**

1. A phase adjusted feedforward amplifier system comprising:

means for receiving an input signal;

means for amplifying said input signal to provide an amplified output signal;

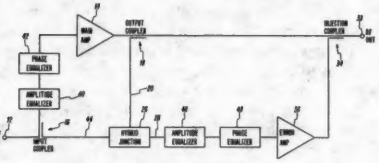
means for sampling said input signal and providing a sampled input signal;

means for phase and amplitude equalizing said input signal so that said amplified output signal is equal in amplitude and phase with said sampled input signal;

means for sampling said amplified output signal to provide a sampled output signal;

means for subtracting said sampled input signal from said sampled output signal to provide a correction signal;

means for amplifying said correction signal to provide an amplified correction signal;



means for phase and amplitude equalizing said correction signal so that said amplified correction signal is equal in phase and amplitude to said amplified output signal; and

means for subtracting said amplified correction signal from said amplified output signal to produce an amplified output of said input signal.

4,595,883

EMITTER-FOLLOWER TYPE SINGLE-ENDED PUSH-PULL CIRCUIT

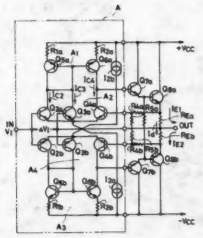
Kazuaki Nakayama, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,789

Claims priority, application Japan, Sep. 6, 1983, 58-162508

Int. Cl.[4] H03F 3/30, 3/45

U.S. Cl. 330—255 **9 Claims**



1. In an emitter-follower type single-ended push-pull circuit having a plurality of transistors, each of said transistors having first, second, and third terminals and conducting between said first and second terminals in accordance with a signal applied at said third terminal, in which resistors are connected between an output terminal and said first terminals of output transistors, and drive transistors are coupled to drive respective ones of said output transistors, the improvement wherein said circuit further comprises: first and second complementary current mirror circuits; and first and second complementary differential amplifier circuits having said first and second current mirror circuits, respectively, coupled thereto as loads, each of said first and second differential amplifier circuits comprising: a first transistor to which an input signal voltage is applied as an input signal; a second transistor to which a voltage at said output terminal is applied as an input signal, said second transistor being connected in parallel with said first transistor; and a third transistor to which a voltage corresponding to a voltage at the first terminal of a respective one of said output transistors is applied as an input voltage, an output at the second terminal of said third transistor being employed as a drive output to a respective one of said drive transistors.

4,595,884

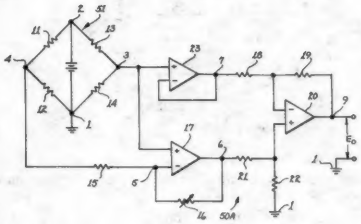
TRANSDUCER AMPLIFIER AND METHOD

Edward J. Miller, Jr., Tempe, Ariz., assignor to Tobar, Inc., Tempe, Ariz.

Filed Oct. 19, 1984, Ser. No. 662,705

Int. Cl.[4] H03F 3/45, 3/68

U.S. Cl. 330—258 **6 Claims**



1. An improved transducer amplifier circuit comprising in combination:

(a) a bridge circuit including a first strain-sensitive resistor connected between a first conductor and a second conductor, a second strain-sensitive resistor connected between the first conductor and a third conductor, a third strain-sensitive resistor connected between the second conductor and a ground conductor, and a fourth strain-sensitive resistor connected between the ground conductor and the third conductor, and a power source connected to the first conductor, the bridge circuit producing a differential signal between the second and third conductors including a relatively large common mode voltage component, and a relatively small error voltage component;

(b) a first operational amplifier having an output, a first input coupled to the third conductor, a second input coupled to the second conductor by a first resistor and to the output by a second resistor, for producing a first voltage difference between the third conductor and the output, the first voltage difference being equal to the gain of the first operational amplifier multiplied by the error voltage component;

(c) a voltage follower circuit including a second operational amplifier having an output, a first input connected to the third conductor, and second input connected to the output of the second operational amplifier;

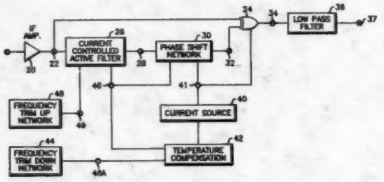
(d) differential to single ended converting circuit means responsive to the first voltage difference for eliminating a common mode voltage component from the first voltage difference to produce an output signal equal to the gain of the differential to single ended converting circuit means multiplied by the first voltage difference, the differential to single ended converting circuit means including a second operational amplifier having an output, a first input coupled to that output by a third resistor and to the output of the third operational amplifier by a fourth resistor, the third operational amplifier having a second input;

(e) a fifth resistor coupling the second input of the third operational amplifier to the output of the first operational amplifier and a sixth resistor coupling the second input of the third operational amplifier to the ground conductor, the voltage follower circuit effectively insulating the bridge circuit from significant loading by the differential to single ended converting circuit means.

4,595,885
ADJUSTABLE ACTIVE FILTER

Yolanda Prieto, Miami, and Walter L. Davis, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1984, Ser. No. 655,823
Int. Cl.[4] H03F *3/191*
U.S. Cl. 330—303 9 Claims



1. An adjustable active filter, comprising:

a transconductance amplifier having an input and an output and a first bias resistor;

a current source for providing a controlled level of bias current to said transconductance amplifier;

a feedback network coupled to said input and said output for establishing predetermined filter characteristics from said input to said output, said filter characteristics including a resonant frequency which is a function of the transconductance of said transconductance amplifier; and

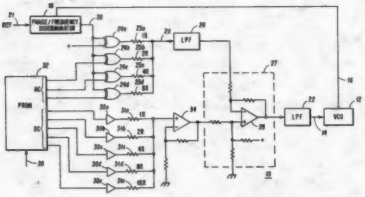
first current adjusting means, coupled to said transconductance amplifier, for adjusting the current provided by said current source to said transconductance amplifier, said first current adjusting means including a first resistor which may be selectively placed in parallel with said first bias resistor, whereby

selectively placing said first resistor in parallel with said first bias resistor alters the transconductance of said transconductance amplifier thereby effectively adjusting said resonant frequency of said filter.

4,595,886
AC LOOP GAIN AND DC PREPOSITIONING ADJUSTMENT FOR PHASE LOCKED LOOP

Alan B. Mroch, and Larry L. Westergren, both of Marion, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 19, 1984, Ser. No. 663,009
Int. Cl.[4] H03L *7/08*
U.S. Cl. 331—1 A 8 Claims



2. A phase locked loop comprising:

means having a control terminal input and responsive to a signal at the control terminal input for providing a variable frequency output which varies in frequency in response to changes in said control signal;

means for providing a reference frequency output;

discriminating means responsive to said variable frequency output and said reference frequency output for detecting differences between said reference frequency output and said variable frequency output to provide a discriminating signal;

AC control means having an input and output and means for varying the gain between its input and output, said input of said AC control means being coupled to the output of said discriminating means and said means for varying the gain including a plurality of exclusive OR-gate resistor pairs constructed and arranged to form a ladder network between the input and output of said AC control means;

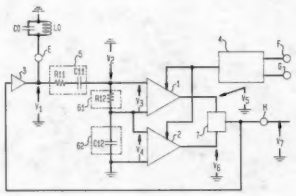
DC control means having an input and output and means for providing a variable DC signal between its input and output to produce a DC prepositioning signal at the output of said DC control means, said means for producing a variable DC prepositioning signal including a plurality of resistors constructed and arranged to form a ladder network; and

means for combining the signals at the output of said AC control means and said DC control means for producing a combined signal output, said combined signal output being coupled to said control terminal input to form a phase locked loop.

4,595,887
VOLTAGE CONTROLLED OSCILLATOR SUITED FOR BEING FORMED IN AN INTEGRATED CIRCUIT

Masami Miura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,268
Claims priority, application Japan, May 24, 1984, 59-105186
Int. Cl.[4] H03L *7/00;* H03B *5/00, 5/12*
U.S. Cl. 331—8 10 Claims



1. A voltage controlled oscillator comprising:

a tank circuit for determining an oscillation frequency;

a first circuit for delaying the phase of the signal having said oscillation frequency;

a second circuit for advancing the phase of the circuit being connected in series with said first circuit;

a third circuit interposed between said tank circuit and said series connection of said first and second circuits, said third circuit having the same equivalent circuit as said series connection of said first and second circuits;

a first gain controlled amplifier amplifying the phase-delayed signal obtained from said first circuit;

a second gain controlled amplifier amplifying the phase-advanced signal obtained from said second circuit;

an adder for adding the outputs from said first and second gain controlled amplifiers;

a means for controlling the gains of said first and second gain controlled amplifiers; and

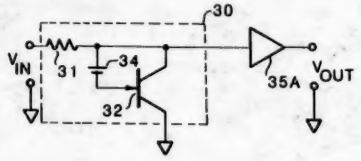
a means for feeding the added signal from said adder to said tank circuit to keep an oscillation of said tank circuit at a frequency determined by the gain of said gain controlled amplifiers.

4,595,888

PRE-DISTORTION SHAPING NETWORK

Brian M. Miller, Spokane, Wash., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Apr. 23, 1984, Ser. No. 602,650
Int. Cl.[4] H03C 3/08
U.S. Cl. 332—18 13 Claims



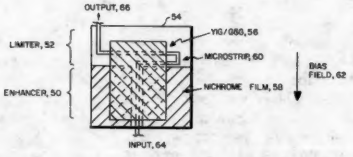
1. A network for reducing distortion in the modulation of the output signal of a voltage controlled oscillator, said network comprising a voltage divider coupled to the voltage controlled oscillator for shaping a modulation signal, the network having a characteristic transfer function, said voltage divider including a semiconductor device biased for unsaturated non-linear operation for providing a controllable non-linear resistance, said semiconductor device introducing a controlled amount of second order non-linearity to said characteristic transfer curve.

4,595,889

FREQUENCY SELECTIVE SIGNAL-TO-NOISE ENHANCER/LIMITER APPARATUS

Steven N. Stitzer, Ellicott City, Md., and Harry Goldie, deceased, late of Randallstown, Md. (by Fritzi Goldie, legal representative), assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 27, 1984, Ser. No. 675,171
Int. Cl.[4] H01P 1/215, 1/23, 5/04
U.S. Cl. 333—17 L 6 Claims



1. A frequency selective signal-to-noise enhancer/limiter apparatus comprising in combination:

a substrate with a microstrip line deposited thereon, said microstrip line having a predetermined thickness,

a nichrome film deposited on said substrate on either side of and parallel to a first portion of said microstrip line, said nichrome film having a predetermined thickness,

a YIG/GGG film deposited over a second portion of said microstrip line and over said first portion of said microstrip line and said nichrome film, said first portion of said microstrip line, said nichrome film and said YIG/GGG film comprising an enhancer means, said second portion of said microstrip line and said YIG/GGG film comprising a limiter means, said first portion of said microstrip line in said enhancer means being perpendicularly arranged with respect to said second portion of said microstrip line in said limiter means, and,

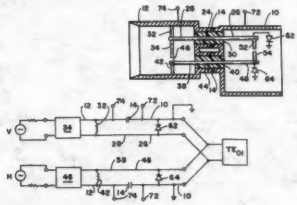
a magnetic bias field oriented parallel to the plane of said enhancer means and said limiter means, said magnetic bias field being applied in a direction that is perpendicular to said second portion of said microstrip line in said limiter means and parallel to said first portion of said microstrip line in said enhancer means.

4,595,890

DUAL POLARIZATION TRANSITION AND/OR SWITCH

Donald C. Cloutier, Exeter, N.H., assignor to Omni Spectra, Inc., Merrimack, N.H.

Filed Jun. 24, 1982, Ser. No. 391,968
Int. Cl.[4] H01P 1/15, 1/161, 5/12
U.S. Cl. 333—103 18 Claims



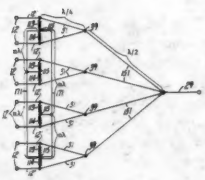
1. A microwave transition device for receiving selectively one of a series of radio signals each of which is polarized in one or the other of two rectangularly related directions, comprising a primary waveguide for acquiring said signals polarized in both directions, first and second waveguide to coax transitions within said primary waveguide for selectively responding one to each of said polarizations, a secondary waveguide, first and second coax to waveguide transitions within said secondary waveguide, each capable of launching the basic mode microwave energy in said secondary waveguide, first and second path means to couple said first and second waveguide to coax transitions to said first and second coax to waveguide transitions, respectively, and switch means for selectively enabling and disabing each of said path means.

4,595,891

MICROWAVE COMBINER HAVING MEANS TO ISOLATE BETWEEN INPUT TERMINALS

Edward A. Cronauer, Massapequa Park, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 27, 1984, Ser. No. 604,568
Int. Cl.[4] H01P 5/16
U.S. Cl. 333—127 5 Claims



1. A microwave combiner arrangement comprising: a plurality of pairs of isolation resistors, each of said pairs effective for isolating adjacent ones of a plurality of pairs of microwave power input terminals, each of the resistors of each pair being substantially equal to the input resistance of a respective one of said input terminals and electrically connected to a corresponding one of a plurality of common terminals at one end, and to a corresponding one of said plurality of input terminals at the other resistor end thereof;

a plurality of pairs of quarter wavelength conductors each for electrically connecting corresponding pairs of input terminals to individual ones of a plurality of corresponding output terminals;

a plurality of half wavelength output conductors for electrically connecting each of said pairs of quarter wavelength means to a final output terminal, said plurality of half wavelength means being additionally effective for connection with a corresponding one of said output terminals; and wavelength conductors for electrically connecting each of said common terminals to at least one other of said common terminals, whereby effective electrical isolation between said input terminals is accomplished.

4,595,892

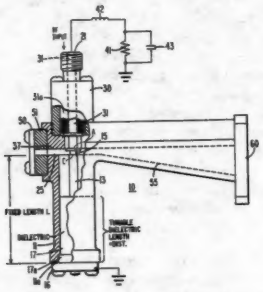
COAXIAL CAVITY RESONATOR HAVING A DIELECTRIC INSERT WHICH IMPEDANCE MATCHES ACTIVE DEVICE USEABLE WITH RESONATOR

James L. Martinetti, Hudson County, and Allen Katz, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 10, 1984, Ser. No. 598,733

Int. Cl.[4] H03B *19/00*; H01P *7/04*

U.S. Cl. 333—218 **4 Claims**



3. A frequency multiplier for producing a desired harmonic output frequency signal of an input frequency signal comprising:

a waveguide capable of supporting said output frequency;

an active device;

a coaxial resonator including an inner conductor and an outer coaxial oonductor with one end of the inner conductor coupled to the active device and the second opposite end shorted to the outer conductor by a heat sinking conductive covering plate connected across and shorting said inner and outer conductors, said resonator resonant at an input frequency which is a subharmonic of said desired output frequency;

means for coupling said active device in series with said coaxial cavity resonator at said input frequency and across said waveguide at said output frequency;

a preformed dielectric ring sized to fit between said inner conductor and outer conductor positioned in said cavity adjacent said heat sinking plate, the length of said ring along said resonator from said heat sinking plate toward said active device coupled end and its dielectric constant being selected such that the reactive impedance of the resonator matches that of the active device at the input frequency; and

said waveguide terminated at one end by a short at a distance to maximize the output at said desired harmonic output frequency.

4,595,893

MICROWAVE TRANSMISSION LINE ELEMENT COMPRISING ONE OR MORE INCORPORATED SWITCHING MEMBERS FOR INSERTING ONE OR MORE QUADRIPOLES

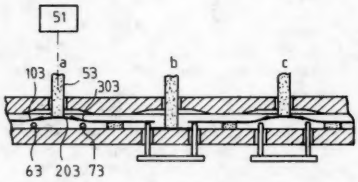
Roger Charbonnier, Meudon Bellevue; Joël Remy, Paris, and Gérard Sauvage, Fontenay Le Fleury, all of France, assignors to Adret Electronique, France

Filed May 2, 1984, Ser. No. 606,015

Claims priority, application France, May 24, 1983, 83 08944; Jan. 31, 1984, 84 01442

Int. Cl.[4] H01P *1/10*

U.S. Cl. 333—246 **6 Claims**



1. A microwave transmission line element comprising:

(i) first and second ground conductors;

(ii) a base conductor disposed between the said ground conductors and parallel thereto, said base conductor comprising first and second fixed segments having respective resiliently deformable ends and a mobile segment;

(iii) means for moving said mobile segment within the space defined by the said ground conductors from a first position in which it connects the resiliently deformable ends of the said first and second fixed segments together to a second position in which it is disengaged from the said resiliently deformable ends and in engagement with the first ground conductor;

(iv) first and second insulating stops having respective ends located opposite predetermined surface portions of the said respective resiliently deformable ends, said predetermined surface portions facing the first ground conductor, and the said mobile segment, engaging, in the first position, the said predetermined surface portions, while, in the second position of the mobile segment, the said predetermined surface portions are freed and have come respectively into contact with said first and second insulating stops by resilient deformation, whereas the first and second fixed segments are unconnected; and

(v) a device adapted to detect an overload in the transmission line element and to control said means for moving said mobile segment.

4,595,894

GROUND FAULT CIRCUIT INTERRUPTING SYSTEM

Richard C. Doyle, Greenlawn, and Lester Rivera, Brooklyn, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

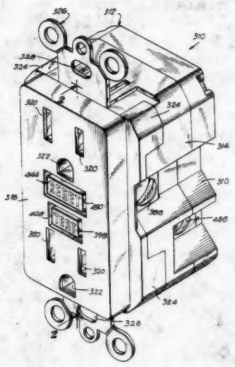
Continuation-in-part of Ser. No. 558,262, Dec. 5, 1983, and a continuation-in-part of Ser. No. 431,982, Sep. 30, 1982, Pat. No. 4,518,945. This application Apr. 1, 1985, Ser. No. 716,991

Int. Cl.[4] H01H *73/00, 73/12, 75/00, 83/06*

U.S. Cl. 335—18 **4 Claims**

1. Switching apparatus for selectively interrupting an electrical connection between input and output conductors, or the like, comprising, in combination: a housing; magnetizable plunger means disposed within a portion of said housing for movement between first and said housing for moving said plunger means when energized from the first position to the second position; an input contact electrically connected to said input conductor; an output contact electrically connected to said output conductor; strap means for mounting the switching

apparatus upon a selected surface, said strap means including portions thereof which define a path of the magnetic field generated by said coil means to influence the position of said plunger means, and movable means responsive to movement of



said plunger means for influencing a separation of said input and output contacts, thereby interrupting electrical connection between them, said movable means including first and second movable members, movement of said second member being caused by movement of said first member.

4,595,895

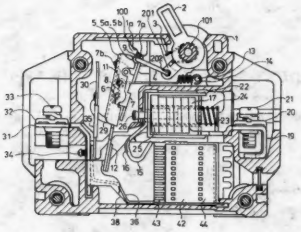
CIRCUIT BREAKER

Hiroshi Fujii; Hiroaki Fujihisa; Hirotoshi Ohishi, and Yoshiaki Kobayashi, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1985, Ser. No. 751,252

Int. Cl.[4] H03J *3/00, 1/04;* **H01H** *9/20*

U.S. Cl. 335—26 **3 Claims**



1. A circuit breaker comprising:

a handle for connection and disconnection of contacts by outside controlling thereof and energized by a spring toward its position of disconnection,

a link member which is linked by its one end to a driving part of said handle, thereby to form a toggle link system together with said handle,

a roller rotatably held on the other end of said link member,

a fixed contact fixed on a part of a case,

a moving contact arm which has a roller receiving indent on one end part and a moving contact on the other end part, is cradlably fulcrumed on the case and is energized in a direction to make said moving contact touch said fixed contact to make said connection,

an engaging lever which has an engaging part disposed to face said roller receiving indent to hold said roller and its cradlably fulcrumed on the case,

an overcurrent trip device which is for releasing said engaging of said roller by said engaging part when an overcurrent above a predetermined value arises, thereby making said moving contact detach from said fixed contact to make said disconnection, and

a roller guide member which is provided in said case to form a roller guiding path together with said roller-receiving-indent for smooth guiding of said roller during its motion from a tripped position where said roller is apart from said roller-receiving-indent to a reset position where said roller is resting on said roller-receiving-indent.

4,595,896

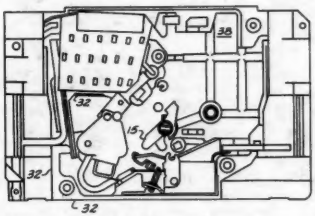
MOLDED CASE CIRCUIT BREAKER HAVING A REINFORCED HOUSING

Bernard DiMarco, Lilburn, Ga., and Charles W. Stanford, Bellefontaine, Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Oct. 1, 1984, Ser. No. 656,236

Int. Cl.[4] H01H *9/02*

U.S. Cl. 335—202 **6 Claims**



1. A molded case circuit breaker, comprising:

a frame;

an operating handle mechanism assembly mounted on the frame;

a contact arm assembly;

an operating link connecting the contact arm assembly and the handle mechanism assembly for movement of the contact arm assembly between an open position and a closed position;

a first molded case housing portion having a plurality of longitudinal and transverse reinforcing protrusions defining spaces for the frame, operating handle mechanism and contact arm assembly;

a second molded case housing portion having a plurality of longitudinal and transverse protrusions defining spaces for the frame, operating handle mechanism and contact arm assembly, said first and second housing portions being matable with one another and entrapping the frame, handle mechanism and contact arm assembly in cavities formed by the longitudinal and transverse protrusions; and

a plurality of ribs reinforcing the walls of the housing portions.

4,595,897

SPEED SENSOR DEVICE

Hiroyuki Amano, Kariya, and Yukihisa Oda, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 13, 1984, Ser. No. 570,308

Claims priority, application Japan, Jan. 13, 1983, 58-003936

Int. Cl.[4] H01H *9/00*

U.S. Cl. 335—205 **5 Claims**

1. A magnetic sensing device utilizing a control circuit and which is operatively associated with a portion of an automobile body, comprising:

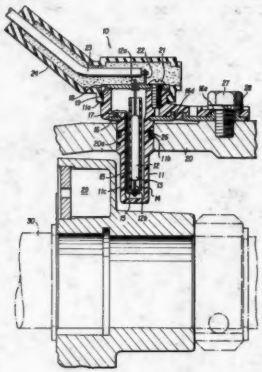
permanent magnet means;

detecting means for detecting a change of magnetic flux of said permanent magnet means applied thereto in response to rotational displacement of said permanent magnet means;

a housing composed of synthetic resin;

a holder member positioned in said housing and formed of an electrically conductive material;

a metal plate member integrally fixed to said housing and having at least one projection extending therefrom into said housing;



a terminal member connected between a first end of said holder member and said metal plate member;

said detecting means having a first end thereof electrically connected with said control circuit and a second end thereof electrically connected with a second end of said holder member; and

means for grounding current from said detecting means to said metal portion of said automobile body via said metal plate member.

4,595,898

COMPOUND-SUPERCONDUCTING COIL

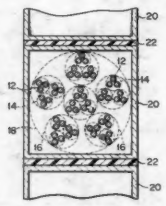
Hachio Shiraki, Kawasaki, and Satoru Murase, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 4, 1984, Ser. No. 607,315

Claims priority, application Japan, May 12, 1983, 58-81690

Int. Cl.⁴ H01F *7/22*

U.S. Cl. 335—216 **7 Claims**



1. A compound-superconducting coil comprising:

a plurality of wires including a plurality of compound-superconducting wires; and

a wound tube which receives said plurality of wires and is provided with void spaces allowing for the passage of a coolant, and wherein the void fraction of the tube is 45% to 70%, and, in a superconducting condition, said coil allows for the passage of a current whose magnitude is at least 80% of a critical current observed before the wire is wound into a coil.

4,595,899

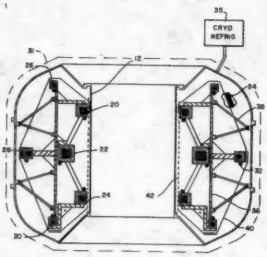
MAGNETIC STRUCTURE FOR NMR APPLICATIONS AND THE LIKE

Todd I. Smith; Michael S. McAshan, both of Palo Alto, and William M. Fairbank, Menlo Park, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 628,452, Jul. 6, 1984. This application Mar. 18, 1985, Ser. No. 713,098

Int. Cl.⁴ H01F *7/22*

U.S. Cl. 335—216 **16 Claims**



1. A magnetic structure useful in NMR applications comprising

a first set of coils provided about a volume and independently energized to establish a field with suppressed lower order derivatives of flux through said volume and a dipole with higher order magnetic moments outside of said first set of coils, and

a second set of coils provided about the first set of coils and independently energized for producing a magnetic field which opposes said dipole of said first set of coils while not substantially affecting the uniformity of said field through said volume.

4,595,900

GRADIENT FIELD COILS FOR NMR IMAGING

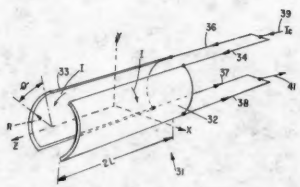
Zvi Kamil, Tel Aviv, and Stephen G. Lipson, Haifa, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Nov. 7, 1984, Ser. No. 668,942

Claims priority, application Israel, Nov. 13, 1983, 70211

Int. Cl.⁴ H01F *5/00*

U.S. Cl. 335—299 **14 Claims**



1. A gradient field generating arrangement comprising:

a pair of oppositely disposed electrical current conductive segments of a hollow cylinder,

said segments being substantially equidistantly spaced from a common longitudinal axis,

means for causing current to flow in the same direction in each of said segments,

the direction of the current generating a magnetic field about each of said segments that is parallel to said longitudinal axis,

the combined field about each of the pair of segments being zero at all points in a first plane which is the mirror symmetry plane that relates one of said pair of segments to the other of said pair of segments,

said combined field varying substantially linearily in a second plane which contains the longitudinal axis, is normal to the said first plane and longitudinally bisects said pair of segments, and

said magnetic field being positively maximum where said second plane bisects said first of said pair of segments and being negatively maximum where said second plane bisects the other of said pair of segments.

4,595,901

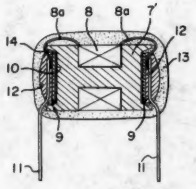
INDUCTANCE DEVICE WITH BONDED METAL FOIL ELECTRODES

Tadao Yahagi, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 378,327, May 14, 1982, abandoned, which is a continuation of Ser. No. 186,123, Sep. 11, 1980, abandoned. This application Feb. 16, 1984, Ser. No. 550,197

Int. Cl.[4] H01F *15/10*

U.S. Cl. 336—192 **2 Claims**



1. An inductance device comprising:

a pair of lead wires;

a magnetic core having an exterior lateral surface extending to opposed recessed ends defined by interior side surfaces extending to a recessed bottom surface;

a coil would around said exterior lateral surface of said core, said coil having ends electrically connected to respective of said lead wires;

a pair of metal foils each comprising a metal selected from the group consisting of copper and aluminum and each bonded directly to a respective recessed bottom surface of a respective recessed end of said core by means of a thermosettable binder contacting each foil and said respective recessed bottom surface, said metal foils each having a main surface contacting only a portion of the respective end of said core and not the entire side surface of said respective recessed end; and

respective of said lead wires and coil ends electrically connected to each other by being soldered to respective of said metal foils.

4,595,902

ANTI-THEFT APPARATUS FOR VEHICLES

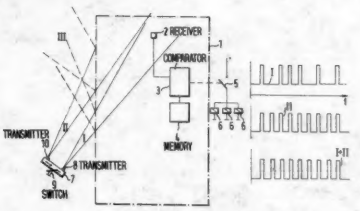
Arnost Proske, Emmering, and Walter Weishaupt, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Fed. Rep. of Germany

Filed Dec. 22, 1982, Ser. No. 452,031

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240945

Int. Cl.[4] B60R *25/00;* **G06F** *7/04*

U.S. Cl. 340—63 **10 Claims**



1. A anti-theft apparatus for vehicles having a lock means having a first transmitter, located outside of the vehicle, transmitting a first code signal without wires or contacts to a first receiver located in the vehicle, wherein comparator means in the vehicle is connected to the first receiver to actuate the lock means of the vehicle only if the first receiver senses a transmission of the first code signal which agrees with a code signal in said comparator means, a second transmitter transmitting a secondary signal of the same kind as the first code signal and which is actuated with said first transmitter, the second transmitter having a transmission orientation different from that of the transmitter for the first code signal so that, when the first code-signal transmitter is oriented to the first receiver, the secondary signal is not oriented to the first receiver and does not reach the first receiver or reaches it after being attenuated considerably or after being overlapped with said first signal, and wherein the comparator actuates the lock means of the vehicle only if the first transmitter is oriented to the first receiver so that the first receiver receives the first code signal as transmitted and will not actuate the lock means of the vehicle if the receiver receives the second signal or a signal caused by an overlapping of said first and second signals.

4,595,903

TAMPER RESISTANT AUTOMOTIVE ANTI-THEFT DEVICE

David F. Arlasky; Ronald F. Arlasky, both of 3241 River Falls Dr., Northbrook, Ill. 60062; Allan B. Crites, 1050 Carswell Ave., Elk Grove Village, Ill. 60007; Carol Miller, 2331 N. Kedzie, Chicago, Ill. 60647; Anthony J. Pellicano, 775 Whalcom La., Schaumburg, Ill. 60193, and Frank W. Weinberger, 1225 N. Stratford Rd., Arlington Heights, Ill. 60004

Continuation of Ser. No. 399,740, Jul. 19, 1982, abandoned. This application Apr. 4, 1985, Ser. No. 718,839

Int. Cl.[4] E05B *63/00;* **B60R** *25/04*

U.S. Cl. 340—64 **2 Claims**

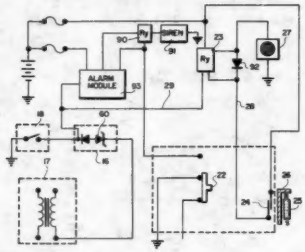
1. In a vehicle anti-theft device having an underhood bolt and keeper, a control head assembly mounted in the vehicle passenger compartment for moving said bolt into engagement with said keeper, a retractable lock on said control head assembly, said lock having a cable retaining lock tail portion, and a reciprocating control cable interconnecting said underhood bolt and said reciprocating lock, the improvement comprising:

underhood bracket means mounted on said vehicle for guiding said underhood bolt;

forward biasing means on said underhood bracket means operatively connected with said reciprocating control cable for urging said underhood bolt toward said underhood keeper;

a slide bolt deadlatch mounted on said bracket means and in contact with said bolt;

a groove on said bolt for receiving said slide bolt deadlatch



and holding said bolt in a fastened condition whereby said bolt engages said keeper;

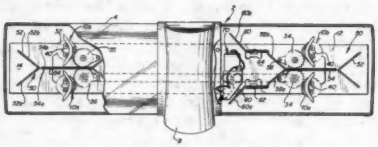
said deadlatch being responsive to separation of said control cable from said cable retaining tail portion.

4,595,904

WARNING LIGHT SYSTEM FOR EMERGENCY VEHICLES

Earl W. Gosswiller, Clarendon Hills, and G. Thomas Ritter, Orland Park, both of Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.

Filed May 16, 1983, Ser. No. 494,797
Int. Cl.[4] B60Q 1/00
U.S. Cl. 340—87 **19 Claims**



1. A warning light system for emergency vehicles comprising:

housing means having transparent portions and being adapted to be attached to a vehicle,

a plurality of light assemblies mounted within said housing means for creating illumination through said transparent panels,

at least one of said light assemblies having a light source arranged to be coupled to a source of electrical power and being mounted for rotation about a generally vertical axis,

drive means for rotating said light assemblies mounted for rotation,

reflective means mounted in said housing means adjacent said light assemblies mounted for rotation, said reflective means cooperating with said rotating light source to produce a plurality of flashes of light through said transparent panels during each rotation thereof, and

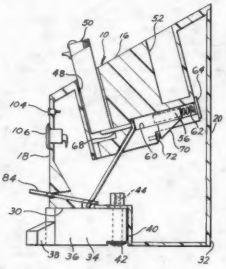
said drive means including a rotatable shaft mechanically coupled to said at least one light assembly whereby said light assembly rotates with said shaft, a motor driving said rotatable shaft, said shaft having an axis and carrying a cam disk in normal relation to the shaft axis, said cam disk defining a peripheral slot, plunger means positioned to engage the periphery of the cam disk as the cam disk rotates, said plunger means being resiliently biased to press against said cam disk and to enter said slot to lock said cam disk and one light assembly into one rotational position when the cam disk rotates to pass the slot by the plunger means, switch means for deactivating said motor when the plunger means enters said slot, and means for retracting said plunger means from the slot to cause activation of said motor and to permit said cam disk and shaft to rotate.

4,595,905

AUTOMATIC SMOKER'S ALARM APPARATUS

Kenneth C. May, Box 211 A, Battletown, Ky. 40104

Filed Feb. 10, 1984, Ser. No. 578,935
Int. Cl.[4] H04Q 3/00
U.S. Cl. 340—309.15 **7 Claims**



1. An automatic smoker's alarm apparatus for use with an ashtray comprising:

a. a hollow housing having a front wall that is adapted to overlie a portion of an ashtray, and a top wall that is furnished with an elongated socket that is adapted to receive a cigarette lighter for storage therein;

b. an electrical switch mechanism associated with the socket for detecting the presence of the lighter within the socket, said switch mechanism having fixed and movable electrical contact means, a spring-biased plunger controlling the movable contact means, where the plunger includes a feeler pin that is capable of extending into the interior of the socket for engaging the lighter;

c. whereby when the lighter is removed from the socket, the plunger is moved automatically by the spring-biasing means to close the switch contact means, the feeler pin in this position of the plunger serving as a temporary obstruction that prevents the bottom of the lighter from descending to the bottom of the socket;

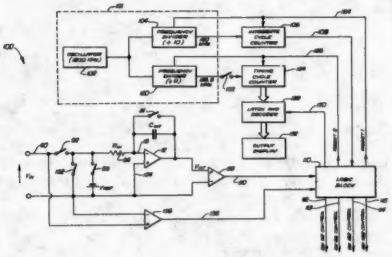
d. the housing including an audible alarm device furnished with an ON delay timer that is controlled by the electrical switch mechanism from a power source so that the alarm device will sound after a fixed time that is generally shorter than the time for smoking an average cigarette;

e. a cigarette crusher mounted adjacent the front wall of the housing, and linkage means joining the crusher to the spring-biased plunger whereby when a cigarette is extinguished on the crusher, the linkage means will compress the plunger against its spring-biasing means to open the switch contact means and deactivate and reset the said ON delay timer to a starting position, said compressed plunger also withdrawing the feeler pin from the socket to allow the lighter to descend to the bottom of the socket thereby holding the plunger against its spring-biasing means and maintaining the switch contacts open for completing the cycle of operation of the apparatus and holding it in readiness for its next use.

4,595,906
SCALED ANALOG TO DIGITAL COVERTER

David Bingham, San Jose, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Aug. 12, 1982, Ser. No. 407,332
Int. Cl.[4] H03K 13/02
U.S. Cl. 340—347 NT 8 Claims



1. A scaled analog to digital converter for a periodic input function comprising:

pulse means for providing a train of pulses;

digital pulse divider means for digitally dividing the pulse train of the pulse means to provide a pulse train at a first frequency and a second pulse train at a second frequency wherein the ratio of the first frequency to the second frequency is 9 to 10;

counter means for counting the pulses of the first frequency to time a predetermined period and for counting the pulses of the second frequency;

integrator means responsive to the counter means, for integrating the input function for the predetermined period wherein the integrator means output has an initial value at the beginning of the predetermined period, the integrator means also having means for integrating upon the expiration of the predetermined period, a reference voltage having a polarity such that the integrator means output returns to the initial value; and

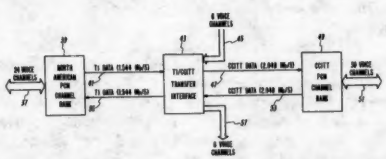
read out means, responsive to the integrator means output, for reading the counter means when the integrator means output returns to the initial value;

wherein the count read from the counter means represents the root mean square of the input function.

4,595,907
PCM DATA TRANSLATING APPARATUS

Charles E. Huffman, and Stephen R. Southerland, both of Plano, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 6, 1983, Ser. No. 529,247
Int. Cl.[4] H04J 3/06
U.S. Cl. 340—347 DD 8 Claims



1. Apparatus for interfacing data channel banks of two different configurations directly without converting to voice frequency comprising, in combination:

first means for supplying and receiving serial information bits at a first clock rate C1 for a plurality of channels N, where the serial bits include both data words for each channel embedded with signalling information and a single bit of frame alignment information for each frame of information;

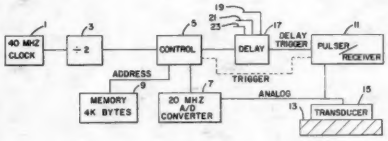
second means for supplying and receiving serial information bits at a second clock rate C2 for a plurality of channels N+M+S where the serial bits of channels M and N include only data and the serial bits of channels S include only signalling information; and

interface means, connecting said first means to said second means, said interface means including means for passing only N channels of data in both directions between said first and said second means in real time whereby the serial bit streams are divided into enough parallel data buses that shifting of common reference points on the digital data bits being transmitted does not exceed ½ cycle of a data bus clocking rate before commencing a new frame of channel information.

4,595,908
CIRCUIT USING SLOW SAMPLING RATE A-D CONVERTER WHICH PROVIDES HIGH SAMPLING RATE RESOLUTION

James H. Gordon, Fairfax, Va., assignor to General Research Corporation, McLean, Va.

Filed Jun. 8, 1982, Ser. No. 386,394
Int. Cl.[4] H03K 13/02
U.S. Cl. 340—347 SH 8 Claims



1. A converter system for sampling a repetitive series of pulses which comprises, in combination:

(a) an analog to digital converter having a predetermined maximum sampling rate,

(b) means for generating pulses at a rate no greater than said maximum sampling rate,

(c) control means responsive to said pulses for initiating sampling by said converter,

(d) delay means responsive to pulses from said control means for initiating a signal therefrom after a variable preselected time delay, said delay means including a delay circuit and selectively controllable means for variably controlling the delay of said delay circuit during sampling of said series of pulses, and

(e) means responsive to a signal from said delay means for transmitting an analog information signal to said converter.

4,595,909
N-BIT PROPAGATARY ANALOG-TO-DIGITAL CONVERTER SYSTEM

Bobby R. Jarrett, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1981, Ser. No. 324,895
Int. Cl.[4] H03K 13/08
U.S. Cl. 340—347 AD 3 Claims

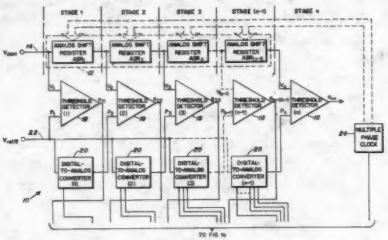
1. An improved n-bit propagatory analog-to-digital converter system having n stages for converting an analog data into a parallel binary output number, which comprises:

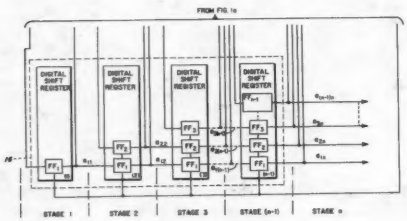
a plurality of analog shift registers ASR_1–ASR_{n-1}, arranged in a predetermined manner so as to comprise an analog delay line, and wherein each of said plurality of analog shift registers includes a peristaltic charge-coupled-device;

a plurality of digital shift registers DSR_1–DSR_{n-1}, arranged in a predetermined manner so as to comprise a digital delay line, and wherein each of said plurality of digital shift registers includes a flip-flop for the first stage of said improved n-bit propagatory analog-to-digital converter, two flip-flops for the second stage, three flip-flops for the third stage up to n−1 stages;

a plurality of threshold detectors TD_1–TD_n, each operatively connected at one of its inputs to said analog delay line in each of the stages 1 through n;

a plurality of digital-to-analog converters DAC_1–DAC_{n-1}, operatively connected to the other inputs of corresponding ones of said threshold detectors, to said digital shift





registers and to each other, DAC_1 being a 1-bit current source DAC and connected in stage 2, DAC_2 being a 2-bit current source DAC and connected in stage 3, DAC_3 being a 3-bit current DAC source and connected in stage 4, . . . up to the n^{th} stage; and

a multiple phase clock having a series of outputs operatively connected to said analog delay line and another output operatively connected to said digital delay line such that they operate in synchronization, and such that each stage from (1) to n of said n-bit propagatory analog-to-digital converter adds one more bit to the conversion as the analog data, inputted at the input of analog shift register ASR_1, propagates down said analog delay line, and is compared to a reference signal for each of the stages.

4,595,910

DIGITAL-TO-ANALOG CONVERTER USEFUL IN A TELEVISION RECEIVER

Charles M. Wine, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

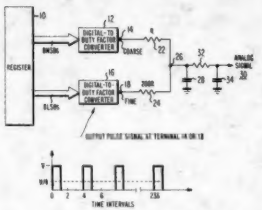
Filed Jul. 28, 1983, Ser. No. 518,146
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA **15 Claims**

1. Apparatus for converting a digital word including a plurality of bits to an analog signal comprising:

means for converting a first group of the most significant bits of said digital word to a first pulse signal having an incrementally variable duty factor;

means for converting a second group of the next most significant bits of said digital word to a second pulse signal having an incrementally variable duty factor; and

analog combining means for differently weighting and then combining said first and second pulse signals and lowpass filtering the resultant signal to produce an analog signal



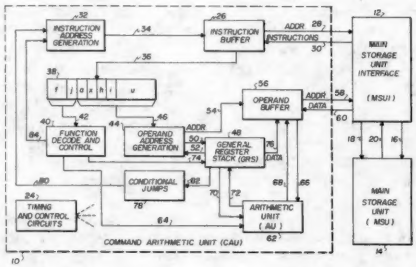
which, in response to consecutive increments of the value of said digital word, has periodic non-monotonic increments.

4,595,911

PROGRAMMABLE DATA REFORMAT SYSTEM

Glen R. Kregness, Minnetonka; Clarence W. Dekarske, St. Paul Park, and Peter B. Criswell, Bethel, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 14, 1983, Ser. No. 514,208
Int. Cl.[4] G06F *5/00*
U.S. Cl. 340—347 DD **25 Claims**



1. In a data processing system having a memory for storing and reading data words having parity bits associated therewith, an arithmetic unit for processing the data words in programmably selected formats, and a control section for causing execution of program instructions, some of which specify reformatting of the data words, and for providing control signals indicative of programmably selected data formats, a programmable data reformat system comprising:

control signal receiving means for receiving program control signals for specifying one of a plurality of data reformatting operations programmably specified by operative instructions, wherein said control signal receiving means includes

instruction receiving means for receiving instruction field signals for designating the field of data signals to be extracted for reformatting,

control mode receiving means for receiving control mode signals for selecting between predetermined reformatting of predetermined fields of said data signals and one of two possible floating point formats,

data mode receiving means for receiving data mode signals for selecting between normal data output, unconditional complement output, and complement output dependent upon predetermined signal conditions,

shift enable receiving means for receiving shift enable signals for selecting predetermined unique positioning of predetermined fields of said data signals, and

clock signal means for enabling selection of the sign of said reformatted ones of data signals, and for controlling manipulation of said data signals in double precision floating-point operations;

data signal receiving means for receiving data signals to be programmably reformatted in a manner specified by said control signals;

parity signal receiving means for receiving parity signals associated with said data signals;

reformat means coupled to said control signal receiving means and to said data signal receiving means for reformatting selected ones of said data signals in said one of a plurality of data reformatting operations programmably predetermined in response to received ones of said control signals; and

parity means coupled to said parity signal receiving means and said control signal receiving means for adjusting parity during reformatting and providing output parity signals indicative of the parity of the reformatted ones of said data signals.

4,595,912
INTEGRATED CIRCUIT FOR GENERATING A TERMINAL VOLTAGE ADJUSTABLE BY A DIGITAL SIGNAL

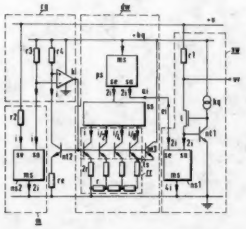
Wolfgang Hoehn, Kirchzarten, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 5, 1984, Ser. No. 597,242

Claims priority, application European Pat. Off., Apr. 8, 1983, 83103435.0

Int. Cl.⁴ H03M *1/00*

U.S. Cl. 340—347 DA **7 Claims**



1. An integrated circuit comprising:

a first terminal coupled to a first voltage source;

a second terminal coupled to a second voltage source;

a common terminal coupled to said first and second voltage sources;

one or more digital signal input terminals;

an output terminal;

a digital to analog converter coupled to said first terminal and to said common terminal for operation from said first voltage source and having one or more inputs coupled to said one or more digital signal input terminals, and an output;

said digital to analog converter comprising

a plurality of transistors, a resistive ladder network coupled to said plurality of transistors and switching stages responsive to digital signals at said one or more inputs for establishing individual current flows through selected ones of said plurality of transistors the current flow through each of said selected ones of said plurality of transistors being determined by said ladder network, said digital to analog converter providing a current flow at said output which is the sum of said individual currents;

a reference voltage source coupled to said digital to analog converter for determining said individual currents;

a current to voltage converter having an input coupled to said output and providing a voltage output at said output terminal; and

a measuring circuit coupled between said second terminal and said common terminal for measuring the voltage at said second terminal and providing an output to said reference voltage source such that the maximum value representable by said digital signals is associated with the voltage at said second terminal.

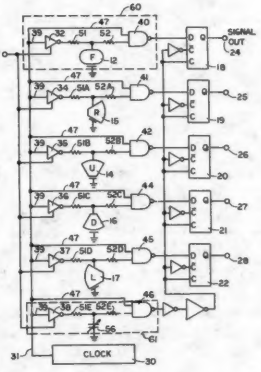
4,595,913
CAPACITOR TOUCH ACTIVATED SWITCHING SYSTEM

Vaughn F. Aubuchon, Sunnyvale, Calif., assignor to Pie Associates, Los Gatos, Calif.

Filed Feb. 10, 1983, Ser. No. 465,601

Int. Cl.⁴ G06F *3/02*

U.S. Cl. 340—365 C **2 Claims**



1. A switching mechanism for generating an output signal responsive to the touch of an operator, comprising:

a clocking signal generator;

a first circuit connected with said touch plate in a manner to effect a different time delay in the transmission of said clocking signal when said plate is touched and untouched;

means for conducting said clocking signal to said first circuit;

means for generating an output signal indicating the time delay effected on said clocking signal thereby to indicate whether the plate is touched or untouched;

said first circuit including an RC circuit with the touch plate forming at least a portion of the capacitive component of the RC circuit;

a NAND gate having first and second terminals with the first terminal connected to receive the output signal from said first circuit and the second terminal connected to receive said clocking signal with said means for generating an output signal receiving the output signal from said NAND gate;

a flip flop circuit having first and second input terminals;

means for transmitting the output signal from said NAND gate to said first terminal of said flip flop circuit;

a second circuit including an RC circuit;

means for transmitting the clocking signal to said second circuit; and

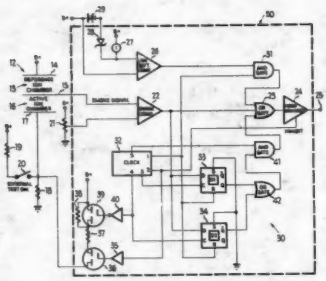
means for transmitting the output signal from said second circuit to the second input terminal of said flip flop whereby the flip flop will generate an output signal responsive to the relative duration of said output signals received at the first and second flip flop input terminals to indicate whether the touch plate is touched.

4,595,914

SELF-TESTING COMBUSTION PRODUCTS DETECTOR

Stephen L. Siegel, Hanover Park, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed Apr. 11, 1983, Ser. No. 483,859
Int. Cl.[4] G08B *29/00, 17/10*
U.S. Cl. 340—515 **16 Claims**



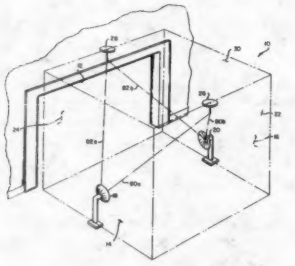
1. In a combustion products detector having a sensor for producing an output signal in response to the presence of an amount of combustion products in excess of a threshold amount, wherein the threshold amount varies inversely with the sensitivity of the sensor, and wherein the desired sensitivity is in a predetermined range between minimum and maximum sensitivities, the improvement comprising: test means for simulating the presence of combustion products in an amount slightly less than the amount corresponding to the maximum sensitivity, control means for actuating said test means, and alarm means coupled to the sensor and responsive to an output signal therefrom for producing a fault indication, whereby a fault indication is produced in response to actuation of said test means when the sensitivity of the sensor exceeds the maximum sensitivity.

4,595,915

ELECTRONIC SURVEILLANCE SYSTEM EMPLOYING THE DOPPLER EFFECT

Leo R. Close, Sepulveda, Calif., assignor to Mrs. Lawrence Israel, Van Nuys, Calif.

Filed Feb. 6, 1984, Ser. No. 577,583
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—572 **12 Claims**



1. A surveillance system for detecting motion of a frequency modulating transponder relative to a surveillance zone, comprising:

a transmitter generating a first signal at a first frequency;

a transmitting antenna coupled to receive the first signal and radiate the first signal throughout the surveillance zone;

first and second receiving antennas disposed in spaced relationship at opposite boundaries of the surveillance zone;

a first receiver coupled to receive from the first receiving antenna a second signal at a frequency different from the first frequency, the first receiver including a doppler detection circuit coupled to generate an indication of any change in frequency of the second signal;

a second receiver coupled to receive from the second receiving antenna a third signal at a frequency different from the first frequency, the second receiver including a doppler detection circuit coupled to generate an indication of any change in frequency of the third signal; and

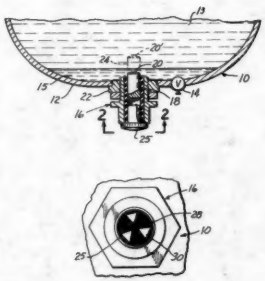
an information processor coupled to receive the indications of changes in frequency of the second and third signals and to generate in response thereto an alarm indication when the indications of changes in frequency of the second and third signals indicate motion within the surveillance zone in a selected direction.

4,595,916

INTEGRAL WATER SENSING AND DETECTING DEVICE

Alvin A. Snaper, 2800 Cameo Cir., Las Vegas, Nev. 89107

Filed Feb. 7, 1984, Ser. No. 578,117
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—604 **3 Claims**



1. A device for detecting the presence of water in a volume of stored fuel comprising;

an aircraft fuel tank for storing said fuel;

a water sensing alloy consisting essentially of between about 20% and 45% each by weight lead, tin and zinc, and between about 0.001% and about 0.1% by weight from the group consisting of copper, samarium, vanadium, and selenium;

mounting means for mounting said water sensing alloy comprised of a threaded body threaded into and passing through said aircraft fuel tank approximate the lowermost portion of said aircraft fuel tank;

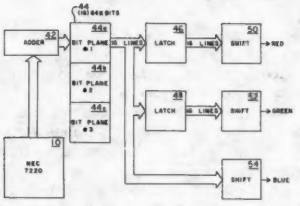
conductive means connected to said water sensing alloy for conducting current generated thereby as a consequence of contact with water,

integrally mounted miniature indicating means connected to said conductive means, said threaded body including a socket exposing said conductive means for receiving said integrally mounted indicating means; said miniature indicating means having a face plate and a plurality of windows, said face plate and said windows having normally matching colors when the water level in said aircraft fuel tank is safe; said windows changing color when there is an excess of water in the tank whereby the presence of water in said tank is indicated by said indicating means.

4,595,917
DATA PROCESSING TECHNIQUE FOR COMPUTER COLOR GRAPHIC SYSTEM

William O. McCallister, and Richard M. Katz, both of Greensboro, N.C., assignors to Vectrix Corporation, Greensboro, N.C.

Filed Jun. 13, 1983, Ser. No. 503,512
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703 **7 Claims**



1. Memory output control circuit for transmitting read data to a computer color graphic imaging system of the type in which a plurality of pixels, each of which is operated by three input color guns, are arranged across the face of the screen and operated responsive to said read data from a memory system, a plurality of data bits from the memory system determining the color of each pixel, said apparatus comprising:

(a) a frame buffer formed of a bank of random access memory chips collectively including data bits sufficient in number such that there is a separate data bit for each input color gun of each pixel;

(b) said frame buffer being divided into three bit planes;

(c) three shift registers, each of which corresponds to one of said bit planes;

(d) a latch means connecting the first and second bit planes to separate ones of said shift registers, the third bit plane being connected directly to the third shift register;

(e) a graphic display control means for generating an address signal during each display cycle;

(f) adding means connecting said graphic display control means and said frame buffer for converting each address signal from said controller means into three read signals, one to each of said bit planes, at spaced time intervals during each display cycles;

whereby the graphic display control means addresses and transfers three words from three bit planes into shift registers during each display cycle.

4,595,918
STROKE WRITING CHARACTER GENERATOR WITH REDUCED BANDWIDTH

Jay R. Dettmer, Columbia, Md., assignor to Sperry Corporation, New York, N.Y.

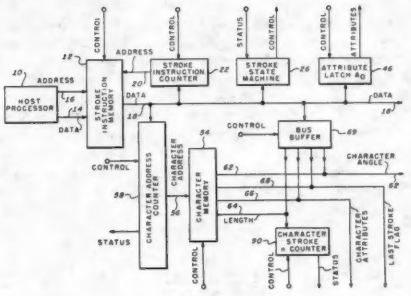
Filed Sep. 2, 1983, Ser. No. 528,834
Int. Cl.[4] G09G *1/10*
U.S. Cl. 340—739 **1 Claim**

1. Stroke display apparatus, having CRT display means with a video input and a display face, for writing a sequence of connected vectors on said display face, each vector having a length associated therewith, comprising:

a stroke state machine having a plurality of states for controlling the generation of said vectors, said plurality of states including a time pause state,

vector length counter means loaded with the length of a vector to be generated for providing an end of vector signal when said vector to be generated attains said length,

said stroke state machine being responsive to said end of vector signal for entering said time pause state in response thereto, so as to insert a time pause between generating each of said vectors, and

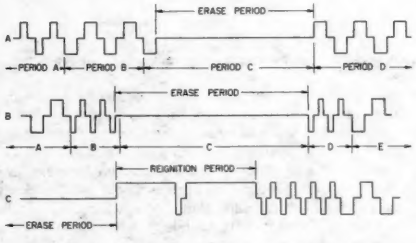


means coupled to said video input for blanking the video of said CRT means to coincidence with said time pause.

4,595,919
SYSTEM AND METHOD FOR OPERATING A DISPLAY PANEL HAVING MEMORY

George E. Holz, North Plainfield, and James A. Ogle, Neshanic Station, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 22, 1983, Ser. No. 525,282
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—793 **7 Claims**



1. A system for operating a display panel with memory wherein the display panel includes

a gas-filled envelope,

a first layer of D.C. scan cells disposed in rows and columns and including row scan anodes and column scan cathodes which cross each other, with the crossings defining said D.C. cells,

an apertured electrode defining rows and columns of display cells, each display cell being in communication with a D.C. scan cell, and

an A.C. electrode associated with and insulated from said apertured electrode and operating therewith as the electrodes for said display cells,

said system comprising

first means coupled to all of said scan anodes for applying operating potential thereto,

second means coupled to said scan cathodes for applying operating potential to each cathode in turn to fire and turn on each column of scan cells in turn sequentially,

third means coupled to said scan anodes for applying data signals to selected ones of said anodes as its column of scan cells is fired and turned on,

fourth means coupled to said apertured electrode and said A.C. electrode for applying sustainer signals thereto, the application of said sustainer signals and said data signals

being synchronized so that, when the data signals are applied, glow is generated in the selected display cells associated with the scan anodes to which the data signals are applied, the sustainer signals sustaining the display glow in such selected display cells, and

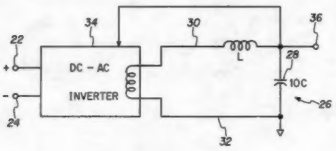
control means coupled to said fourth means for modifying said sustainer signals to include (1) a period of second sustainer signals which are at a lower frequency than that of said sustainer signals which reduces the brightness of any display cells which are "on" and glowing, (2) a period in which the sustainer signals are at a constant positive level and, during this period, the columns of scan cells are scanned sequentially and data signals are applied to turn on selected associated display cells, and (3) a remainder period during which the sustainer signals are at said lower frequency.

4,595,920

LOW-LOSS SINUSOIDAL DRIVE SYSTEM AND TECHNIQUE

Wesley G. Runyan, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 17, 1983, Ser. No. 523,998
Int. Cl.[4] G09G 3/00
U.S. Cl. 340—805 **14 Claims**



2. A power supply and drive system for a display comprising:

a display element having a common backplane electrode and a plurality of individual segment eletrodes;

means for producing and maintaining a resonating sinusoidal output signal from an inductance-capacitance resonant tank circuit and coupling said output signal to said backplane electrode by coupling said display element in electrical parallel with the capacitance of said tank circuit; and

means for applying control signals to selected ones of said plurality of segment electrodes for causing said selected segment electrodes to become luminous.

4,595,921

METHOD OF POLLING TO ASCERTAIN SERVICE NEEDS

An Wang, Lincoln, Mass.; Gary N. Stapleford, Londonderry, and Richard W. Neiss, Hollis, both of N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Aug. 11, 1983, Ser. No. 522,202
Int. Cl.[4] H04J 3/16
U.S. Cl. 340—825.08 **1 Claim**

1. A method for operating and expanding a communications system, said system having, prior to expansion, a masterstation and a plurality of prior operating stations S_i (where i takes various values to specify a particular operating station), a forward communication channel on which signals are communicated from said masterstation to all of said prior operating stations, a return communication channel on which signals are communicated from any of said prior operating stations to said masterstation, the time for propagating a signal from the masterstation to each prior operating station being p_i and the time for propagating a signal from each prior operating station to the masterstation being p_i', including the steps

prior to expanding,

assign to and store at each prior operating station S_i an assigned delay value d_i specific to each operating station such that each prior operating station's returned delay value $D_i = p_i + p_i' + d_i$ is distinct for each prior operating station S_i,

transmit from said masterstation on said forward communication channel a distinctive polling sync signal,

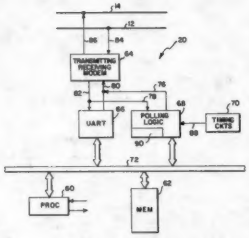
transmit on the return channel from each prior operating station which needs service a polling reply signal indicative of needing to use a communication channel, said reply signal being emitted after the assigned delay interval d_i specific to the station after receiving said polling sync signal,

receive at said masterstation the signals indicative of needing service and associate the arrival times of such signals with operating station addresses to ascertain which operating stations need service,

initiate from the masterstation an addressed massage exchange with each prior operating station ascertained to need service to ascertain what service is needed,

and at the time of expansion

connect a new operating station to any point along said forward and return communication channels,



while leaving unchanged delay times d_i assigned to and stored at all prior operating stations, assign to and store at said new station an assigned delay value d_n such that the new station's returned delay value $D_n = p_n + p'_n + d_n$ is distinct from the returned delay value D_i of any of the prior stations,

and after expansion

transmit from said master station on said forward communication channel a distinctive polling sync signal,

transmit on the return channel from each prior operating station which needs service and from said new operating station if it needs service a polling reply signal indicative of needing to use a communication channel, said reply signal being emitted after the assigned delay interval d_i or d_n specific to the operating station after receiving said polling sync signal,

receive at said masterstation the signals indicative of needing service and associate the arrival times of such signals with operating stations to ascertain which operating stations need service,

initiate from the masterstation an addressed message exchange with each prior operating station ascertained to need service to ascertain what service is needed.

4,595,922

METHOD AND APPARATUS FOR MONITORING KEYS AND OTHER ARTICLES

Richard G. Cobb, 605 S. First, Apt. #1, 68701, and S. Keith Chesterton, both of Madison County, Nebr.

Filed Dec. 10, 1984, Ser. No. 680,081
Int. Cl.[4] G06F 7/04; G08B 5/22
U.S. Cl. 340—825.49 **13 Claims**

1. Apparatus for storing and monitoring the locations of articles such as keys, said apparatus comprising:

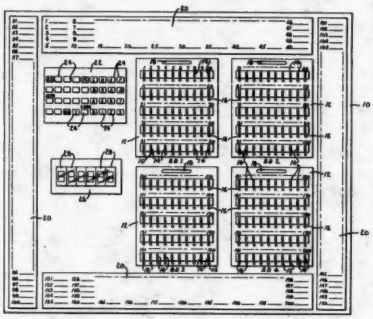
a plurality of article holders each holding one article and

each having a unique identification code which identifies the article held thereby;

a storage member having a plurality of fixed and stationary storage locations for the articles, each storage location having a unique address and being adapted to receive and store one article holder at a time, each article holder being removable from the storage location at which it is stored and each article holder being replaceable on the storage member at any randomly selected storage location which is not already storing another of the article holders;

an indicator for each storage location on said storage member, each indicator having energized and deenergized conditions;

means for scanning all of said addresses periodically to determine and periodically update for each address the identification code of the article holder stored at the storage location corresponding to the address;



means for accepting and recording valid user codes assigned to authorized users;

means for accepting coded requests each requesting the storage location of an article holder, each request corresponding to the indentification code of the article holder whose storage location is requested;

means for energizing the indicator for the storage location of each article holder whose identification code corresponds to a coded request, thereby indicating the location of the article holder to which each coded request corresponds;

means for recording the identification code of each article holder that is removed from said storage member; and

means for displaying the user code and the identification code of each removed article holder, thereby identifying the user code of the user who removed each article holder that has been removed from said storage member.

4,595,923

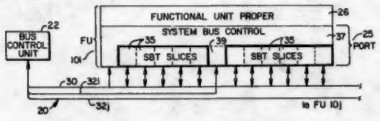
IMPROVED TERMINATOR FOR HIGH SPEED DATA BUS

Harold L. McFarland, Jr., Santa Clara, Calif., assignor to ELXSI, San Jose, Calif.

Division of Ser. No. 313,525, Oct. 21, 1981, abandoned. This application Apr. 24, 1984, Ser. No. 603,476

Int. Cl.[4] H04Q *9/00*; H04J *3/02*

U.S. Cl. 340—825.52 **7 Claims**



1. A bus system wherein individual members of a plurality of N functional units may communicate with one another comprising:

backplane means including at least one pair of spaced conductors defining a transmission line having first and second ends for the propagation of signals therealong;

a plurality of M connectors evenly spaced along said transmission line, M being larger than N, said spaced conductors and said connectors defining an effective transmission line impedance Z_0;

a plurality of N port means, each said port means being associated with a given functional unit, each said port means being adapted to couple to a connector and result in a predetermined loading of said transmission line;

said N port means, when coupled to the first N of said connectors adjacent said first end, defining a populated section of said transmission line adjacent said first end and an unpopulated section adjacent said second end, the connector adjacent said populated section at the end of said populated section nearest said second end being designated a border connector;

said predetermined loading being such that said populated section is characterized by an effective impedance Z_0';

first termination means for terminating said first end with a resistance corresponding to Z_0';

second termination means for terminating said second end with a resistance corresponding to Z_0; and

third termination means coupled to said transmission line at said border connector corresponding to a resistance Z_0'' such that Z_0 and Z_0'', taken in parallel, equals Z_0'.

4,595,924

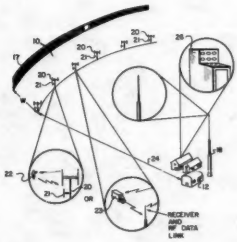
INTRUDER DETECTION RADAR SYSTEM AND AUTOMATIC NULLING ANTENNA ARRAY

John B. Gehman, La Jolla, Calif., assignor to General Dynamics Electronics, San Diego, Calif.

Continuation of Ser. No. 308,992, Oct. 6, 1981, abandoned. This application Jul. 9, 1984, Ser. No. 629,067

Int. Cl.[4] G01S *13/04*; G08B *13/18*

U.S. Cl. 343—5 PD **9 Claims**



1. An intruder detection system for a secure area perimeter, comprising:

a omni-directional transmitter antenna positioned substantially at the center of a secure area;

means coupled to the transmitter antenna for causing an electromagnetic continuous wave signal to radiate an annular ring surveillance zone surrounding the transmitter antenna and extending outwardly from the antenna beyond the secure area ring perimeter to an outside ring perimeter;

a plurality of receiving antennas circumferentially spaced around the secure area ring perimeter at known distances from one another for receiving a portion of a signal reflected by an intruder moving within the annular surveillance zone, and for simultaneously receiving a portion of the direct signal radiated from the transmitter antenna;

means coupled to the receiving antennas for comparing the reflected signal portion and the directly radiated signal

portion received by the antennas and producing an output signal representative of the doppler cycles of phase difference between the reflective signal portion and the directly radiated signal portion;

means for receiving the phase difference output signals from one or more adjacent antennas and computing tracking data representative of the location, speed and direction of motion of an intruder within the surveillance zone, and including means for displaying intruder tracking data; and

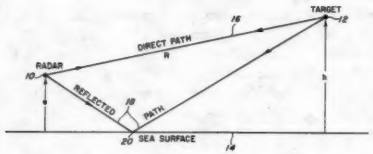
means for transmitting the phase difference signals from the receiving antennas to the receiving and tracking means.

4,595,925

ALTITUDE DETERMINING RADAR USING MULTIPATH DISCRIMINATION

James P. Hansen, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 28, 1983, Ser. No. 479,583
Int. Cl.[4] G01S *13/08*
U.S. Cl. 343—13 R **10 Claims**



1. A height-determining radar, comprising a radar transmitter having a transmission site located at an altitude e above a reflecting surface, for emitting pulses of radiation;

a radar receiver having a reception site in proximity to said transmission site for detecting said pulses of radiation reflected from a target located at an altitude h above said reflecting surface;

means for measuring the pulse width variation τ_B from pulse to pulse of said received pulses of radiation;

means for measuring the range R between said radar receiver reception site and said target; and

means for calculating h from the relationship between τ_B, R, e and h

$$h = cR\,\tau_B/4e$$

wherein c is the speed of light.

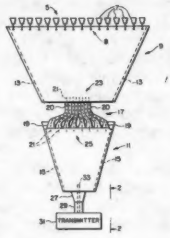
4,595,926

DUAL SPACE FED PARALLEL PLATE LENS ANTENNA BEAMFORMING SYSTEM

Joseph P. Kobus, and Kenneth A. Ringer, both of Phoenix, Ariz., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1983, Ser. No. 557,014
Int. Cl.[4] H01Q *3/26*; G01S *19/06*
U.S. Cl. 343—368 **5 Claims**

1. A beamforming system for a linear phased array of antenna radiators, comprising: first and second series connected parallel plate constrained unfocused lenses, each of said lenses including a pair of parallel plates in the form of isosceles trapezoids having inputs along the shorter parallel ends and outputs along the longer parallel ends and a spacing between said parallel plates of less than one half a wavelength at the highest operating frequency, the first of said lenses being smaller than the second of said lenses, said first lens having a single input and a plurality of output ports, said second lens having a like plurality of input ports said single input port being arranged to space feed said first lens output ports, said input ports of said second lens forming a linear array for space feeding the output ports of said second lens and the radiators of said array, an interlens coupling system including a first plurality of waveguides connecting said output ports of said first lens to said



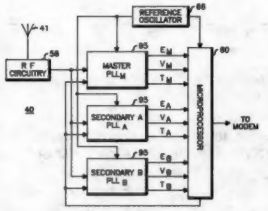
input ports of said second lens including a phase shifter and a circulator in each of said waveguides, and wherein said lenses apply a desired amplitude distribution to said linear phased array whereby a low sidelobe antenna pattern will result.

4,595,927

LORAN C CYCLE SLIP REDUCTION TECHNIQUE

Ralph E. Menick, Euless, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1984, Ser. No. 628,052
Int. Cl.[4] G01S *1/24*
U.S. Cl. 343—390 **6 Claims**



1. A technique for reducing cycle slip in a rapid fading, high signal-to-noise environment in a phase locked loop having a bandwidth comprising the steps of:

sensing the signal-to-noise relationship; and

narrowing the phase locked loop bandwidth when said signal-to-noise relationship exceeds a predetermined threshold,

whereby decreasing the phase locked loop bandwidth degrades the ability of the phase locked loop to track rapid phase excursions.

4,595,928

BI-DIRECTIONAL ANTENNA ARRAY

Jefferson C. Wingard, Rte. #1 Country Pl., Anderson, S.C. 29621

Filed Dec. 28, 1978, Ser. No. 974,066
Int. Cl.[4] H01Q *3/24, 7/00*
U.S. Cl. 343—742 **7 Claims**

1. A bi-directional array for scanning a bi-directional pattern to better utilize a congested frequency spectrum comprising:

a base axis;

a first continuously curved loop antenna element vertically carried by said axis;

a second continuously curved loop antenna element carried vertically by said base axis;

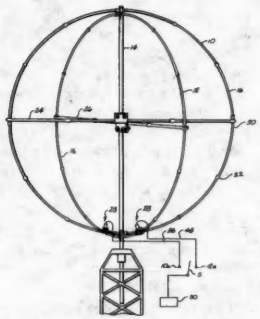
said base axis lying in the plane of both said first and second loop elements;

input terminal means connected to said first and second antenna elements adopted for connection to a radiation source;

a first bi-directional pattern radiated by said first antenna elements adopted for connection to a radiation source;

a first bi-directional pattern radiated by said first antenna element having a major signal load extending generally equally in opposite directions from said base axis and a minor signal load in a direction generally perpendicular to said major signal load direction;

a second-bi-directional pattern radiated by said second antenna element having a major signal load extending generally equally in opposite directions from base axis, and a minor signal load in a direction generally perpendicular to said major signal load;



said first and second antenna loop elements carried about said base axis with the vertical planes of said loop elements mutually perpendicular to one another and adapted so that either antenna element may be selectively operated to produce either of said bi-directional patterns to the exclusion of a significant position of the non-selected pattern affording a high degree of side rejection so that a congested frequency spectrum may be better utilized and

said loop elements including a plurality of individual flexible generally straight sections, each section including a center conductive core encapsulated by an outer layer of dielectric materal affording structural rigidity and enabling said sections to bend and be joined end-to-end to form said curved loop configuration and to be resilient for disassembly thereafter.

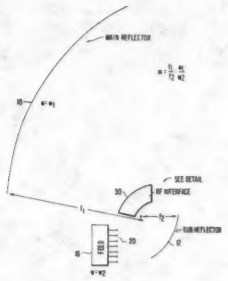
4,595,929

SCHEME FOR ABERRATION CORRECTION IN SCANNING OR MULTIPLE BEAM CONFOCAL ANTENNA SYSTEM

Randall W. Kreutel, Jr., Rockville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Apr. 13, 1982, Ser. No. 367,853
Int. Cl.⁴ H01Q *19/19*
U.S. Cl. 343—781 P **4 Claims**

1. A scanning or multiple beam confocal antenna, wherein said antenna comprises a feed for radiating a feed beam at a feed frequency ω_1, a main reflector, and a subreflector for receiving said feed beam and reflecting it toward said main reflector, said main reflector radiating a beam at a radiation frequency ω_2, said antenna further comprising frequency conversion means disposed between said main reflector and subreflector for receiving said feed beam reflected from said subreflector, frequency converting said feed beam and radiating toward said main reflector a radiation beam comprising said frequency-converted feed beam, said feed frequency ω_1 and radiation frequency ω_2 being different from one another, wherein said frequency conversion means comprises a plurality of first sampling elements for receiving or radiating said feed beam, a plurality of second sampling elements for receiving or radiating said radiation beam, a plurality of mixers coupling respective ones of said first and second sampling ele-



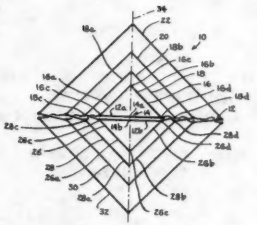
ments at a frequency conversion rate determined by a mixing signal, and a local oscillator for providing said mixing signal to each of said plurality of mixers.

4,595,930

PLANAR LOG PERIODIC QUAD ARRAY

James W. Fisher, Jr., Rd. 1, Box 424, Emmaus, Pa. 18049

Filed Jul. 23, 1984, Ser. No. 633,308
Int. Cl.⁴ H01Q *11/10*
U.S. Cl. 343—792.5 **2 Claims**

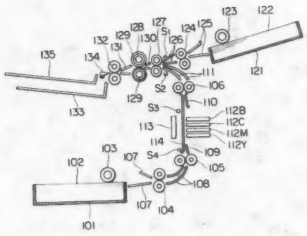


1. A broadband array comprising a twisted two-conductor transmission line extending in opposite directions from a center feed point and a plurality of conductor elements arranged in log periodic manner along the transmission line, said elements being arranged in two sets with one set lying substantially in a plane on one side of the transmission line and the other set lying substantially in the same plane on the opposite side of the transmission line, any given element in said one set having two points of connection with a particular conductor of the transmission line and comprising two sides each extending from a respective corresponding one of the two points of connection to the particular conductor to join at a corner which lies on an imaginary line perpendicular to the transmission line at the center feed point, immediately adjacent elements of said one set being connected to alternate ones of said two conductors of said line, and each element of said other set having generally geometric symmetry about the transmission line with respect to a corresponding element of said one set but with its points of connection to the transmission line being to the opposite conductor.

4,595,931
RECORDING METHOD

Shigeo Toganoh, and Ryuichi Arai, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,246
Claims priority, application Japan, Mar. 19, 1983, 58-46702
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 9 Claims

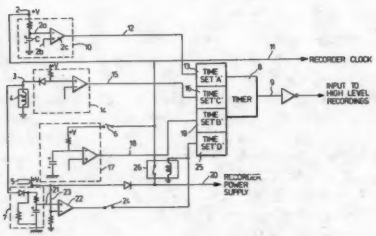


1. A recording method which comprises the steps of:
providing at least one ink jet head for recording with a recording liquid;
recording an image on a recording surface of a recording material with recording liquid deposited thereon by said ink jet head; and
laminating a transfer material carried on a substrate onto said recording surface having the recorded image thereon by pressing one face of said transfer material against said recording surface and thereafter separating said substrate from said transfer material thereby to have said transfer material remain on said recording surface having the recorded image thereon, wherein said substrate is provided with a predetermined surface configuration which is imparted to the other face of said transfer material for providing said recording material with a different surface and enhancing the appearance of the recorded image.

4,595,932
RECORDER WITH CIRCUIT LINE TAMPER INDICATING SYSTEM

Hermann Ruhl, 133 Richmond St. W., Toronto, Canada (M5H 2L7)

Filed Apr. 18, 1983, Ser. No. 486,120
Int. Cl.[4] G09B *19/16*
U.S. Cl. 346—33 R 10 Claims

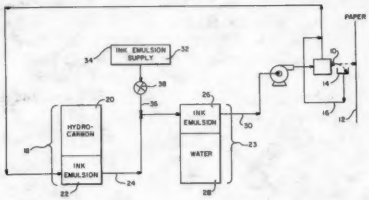


1. A transportation equipment recording system for recording operating parameter information of the equipment on a recording medium, being characterized by at least one sensing means for sensing occurences of circuit line impedance changes representative of unauthorized inoperative periods within said recording system and recording means responsive to said sensing means for visually recording such occurences on the recording medium.

4,595,933
INK LIQUID SUPPLY APPARATUS

Edward F. Mayer, San Jose, Calif., assignor to RICOH Systems, Inc., San Jose, Calif.

Filed May 6, 1985, Ser. No. 731,136
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 9 Claims

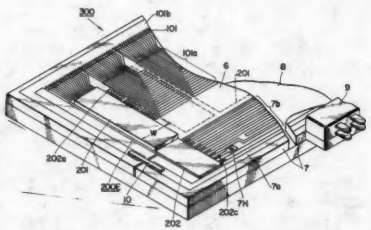


1. An ink liquid supply apparatus for an ink jet printing apparatus, said ink liquid supply apparatus comprising:
ink collecting means disposed adjacent to an ink jet,
a first conduit means for circulating ink from said ink collecting means to a hydrocarbon liquid receptacle, said hydrocarbon liquid receptacle containing a hydrocarbon liquid supply on the top layer and an ink emulsion on the bottom layer,
a water receptacle containing a water supply on the bottom layer and an ink emulsion on the top layer,
a second conduit means connecting said hydrocarbon liquid receptacle to said water receptacle,
a third conduit means connecting said water receptacle to said ink jet,
an ink emulsion supply system comprising an ink emulsion supply tank containing a supply of stable ink emulsion communicating with said second conduit means.

4,595,934
THERMAL RECORDING HEAD

Shoji Arai, Kyoto; Izumi Okamoto, Osaka, and Masayoshi Mihata, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Jun. 6, 1984, Ser. No. 617,942
Claims priority, application Japan, Jun. 9, 1983, 58-103688
Int. Cl.[4] B41J *3/20*
U.S. Cl. 346—76 PH 17 Claims



1. A thermal head for use in thermal recording, comprising a base plate;
an array of heat generator elements mounted on said base plate, said array extending in a first direction;
a plurality of semiconductor chips mounted on said base plate and extending in said first direction, each of said semiconductor chips including a plurality of switching elements having respective electrode terminals thereof connected electrically to said heat generator elements, said electrode terminals being arranged to form a line on

said semiconductor chip, said line extending in a section direction substantially perpendicular to said first direction;

a plurality of conductors for applying a picture signal and power supply voltages to said switching elements; and

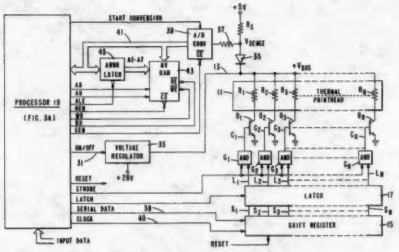
a flexible film in contact with each of said semiconductor chips, each of said flexible films having conductive foil leads thereon for electrically connecting said conductors to said switching elements.

4,595,935

SYSTEM FOR DETECTING DEFECTIVE THERMAL PRINTHEAD ELEMENTS

Ralf M. Brooks; Arvindkumar C. Vyas, and Brian P. Connell, all of Waterloo, Canada, assignors to NCR Canada Ltd., Mississauga, Canada

Filed Aug. 14, 1984, Ser. No. 640,894
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **13 Claims**



1. In a thermal printer including a linear array of thermal elements, an apparatus comprising:

means for producing during a first mode of operation serial character data having a preselected number of character positons selectively associated with said thermal elements and for producing during a second mode of operation serial test data;

means coupled to said thermal elements being selectively responsive to said serial test data for developing for each of said thermal elements an associated test signal during each second mode of operation;

means for selectively comparing each test signal for each said thermal element against an associated predetermined reference signal in order to automatically generate an associated failure signal when a defective thermal element is detected during a second mode of operation; and

means responsive to a failure signal associated with a defective thermal element for automatically causing said producing means to change the character positions associated with said thermal elements so that said defective thermal element is located between adjacent character positions.

4,595,936

RECORDING APPARATUS WITH A RETRACTABLE RECORDING HEAD

Toshifumi Nakajima, Yokohama, and Takehiko Kiyohara, Zama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1983, Ser. No. 464,574
Claims priority, application Japan, Feb. 12, 1982, 57-19553
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—139 R **2 Claims**

1. Recording and reading apparatus comprising:

reciprocating means for reciprocating between first and second stop positions;

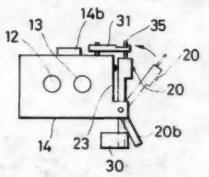
a recording head mounted on said reciprocating means for recording on a recording medium;

supporting means for supporting the recording medium;

a read-out head mounted on said reciprocating means for reading image information on an original;

applying means for urging said recording head to said supporting means by utilizing the moving force of said reciprocating means;

retracting means for retracting said recording head from said supporting means by utilizing the moving force of said reciprocating means; and



control means for operating said retracting means before reading image information with said read-out head and maintaining said recording head away from said support means while reading is performed and for operating said applying means before recording with said recording head and permitting said applying means to urge said recording head to said supporting means while recording is performed.

4,595,937

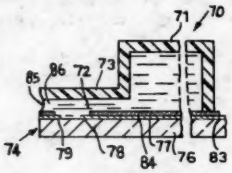
INK JET PRINT HEAD

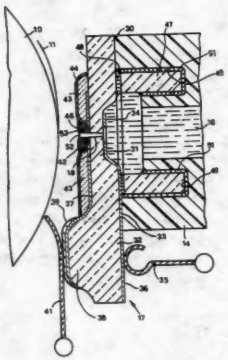
Renatol Conta, Ivrea, and Enrico Manini, Camandona, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

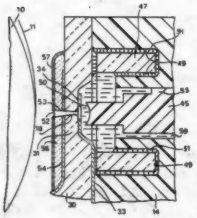
Filed Jun. 6, 1984, Ser. No. 617,804
Claims priority, application Italy, Jun. 10, 1983, 67640 A/83
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **25 Claims**

1. An ink jet print head comprising a container (14) for an electrically conductive ink (16) in contact with an electrode (34), wherein the container (14) is closed by a plate (17) comprising a base portion (31) of ceramic material and a metal layer (54) which is less than 50μ in thickness, and wherein the plate is provided with a capillary nozzle (18) formed by a hole which passes through the base portion and the metal layer, which acts as a counterelectrode (46; 54), the ink having such a pressure as to form a meniscus (52) at the outside end of the nozzle, whereby the counterelectrodes is spaced from the said electrode along the axis of the nozzle, the emission of the ink being caused by selectively energizing the electrode with respect to the counterelectrode with voltage pulses so as to cause vaporization of a portion of ink in the nozzle by the effect of the density of current through the ink in a section of the nozzle, characterized in that the plate (17) also comprises a dielectric layer (56; 58; 62) having a capillary hole (53; 54), which forms the front part of the nozzle (18), so that the counterelectrode (46; 54) is set back into the nozzle (18), whereby there is a predetermined thickness of ink (16) in the front part

(53; 60; 64) of the nozzle between the meniscus (52) and the said section of the nozzle, whereby the vaporization of ink in







this section causes the expulsion of at least part of the ink of the said thickness.

4,595,938

INK JET PRINT HEAD

Renstol Conta, Ivrea, and Enrico Manini, Camandona, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

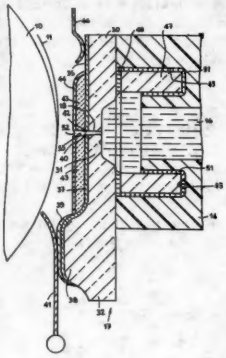
Filed Jun. 6, 1984, Ser. No. 617,813

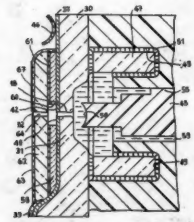
Claims priority, application Italy, Jun. 10, 1983, 67641 A/83

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **17 Claims**

1. An ink jet print head comprising a container (14), for a conductive ink (16), provided with a capillary nozzle (18), a pair of electrodes (40, 42) disposed in the nozzle and facing each other across the nozzle, the ink forming a meniscus (52) in the nozzle at a position such as to create a predetermined depth of ink between the electrodes and the meniscus, and wherein at least part of this depth of ink is expelled by selectively energizing the electrodes with voltage pulses such as to cause vaporization of a portion of ink by the effect of the current through the ink in the section of the nozzle between the electrodes, said container being closed by an insulating plate (30) on which there is disposed a metal strip (37) of a thickness of less than 50μ and of a width which is less than the diameter of the nozzle, the nozzle (18) comprising a hole passing through the plate and the metal strip which thus forms the two electrodes





(40, 42), characterized in that a ceramic collar (47) is bonded to the inward side of the plate (30) and is substantially concentric with the nozzle (18), said collar being also bonded into a complementary seat (49) of said container (14).

4,595,939

RADIATION-CONTROLLABLE THYRISTOR WITH MULTIPLE, NON-CONCENTRIC AMPLIFIED STAGES

Yoshihiro Yamaguchi, Urawa, and Hiromichi Ohashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 29, 1983, Ser. No. 527,477

Claims priority, application Japan, Nov. 15, 1982, 57-199961; Nov. 15, 1982, 57-199962

Int. Cl.[4] H01L *29/74*

U.S. Cl. 357—38 **17 Claims**

1. A radiation-controllable semiconductor rectifier comprising:

(a) a main thyristor which is formed of an electrical trigger thyristor having four semiconductor layers with mutually different conductivity types corresponding to a first emitter layer, first and second base layers and a second emitter layer, and which adjusts transmission of an electrical power; and

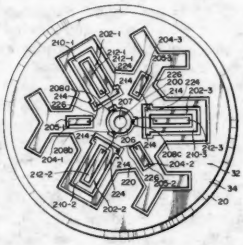
(b) control means for receiving a control radiation such as light and for controlling the operation of said main thyristor in response to said radiation, said control means comprising,

(i) a first-stage pilot thyristor formed of a radiation trigger thyristor having an emitter electrode and a radiation sensitive area to receive said radiation,

(ii) a plurality of pilot thyristors non-concentrically

formed with respect to each other and said first-stage pilot thyristor to provide second- and final-stage pilot thyristors formed of electrical trigger thyristors each having emitter electrodes and gate electrodes, said electrical trigger pilot thyristors being serially connected so that each succeeding pilot thyristor stage is ignitable or turned on in response to turning on of the preceding pilot thyristor stage,

(iii) a collector electrode layer formed on said second base layer of said four semiconductor layers so as to surround pilot thyristors,



(iv) first conductive wire means for electrically connecting said emitter electrode of said first-stage radiation trigger pilot thyristor both to the gate electrode of said second-stage electrical trigger thyristor and to the emitter electrode of said final-stage electrical trigger thyristor, and

(v) second conductive wire means for sequentially and electrically connecting the emitter electrode of each of said electrical trigger thyristors to the gate electrode of the thyristor at the next stage of each of said thyristors.

4,595,940

UNIT CELL FOR INTEGRATED-CIRCUIT GATE ARRAYS

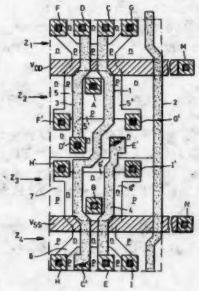
Marco Gandini, and Dante Trevisan, both of Turin, Italy, assignors to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Apr. 15, 1983, Ser. No. 485,170

Claims priority, application Italy, Apr. 15, 1982, 67501 A/82

Int. Cl.[4] H01L *27/08, 29/78, 27/10*

U.S. Cl. 357—42 **8 Claims**



1. A semiconductor chip comprising:

a substrate divided into a multiplicity of unit cells of rectangular outline convertible into logic gates by selective metallization, said substrate being provided with two supply buses in the form of metallic strips extending across a row of such unit cells parallel to the minor sides of the rectangular areas thereof, said buses dividing each of said areas into two marginal regions adjacent said minor sides and a central region between said buses,

each of said unit cells including two major doped portions of opposite conductivity types respectively extending across said buses in insulated relationship therewith,

each of said major doped portions being the side of a respective pair of cascaded MOS field-effect transistors bridging said central region and a respective one of said marginal regions while occupying respective quadrants of said rectangular area,

each of said major doped portions being traversed by two substantially symmetrically disposed minor doped portions of the opposite conductivity type extending across one of said buses and defining channel sections lying between two outer terminal sections and an inner terminal section of the respective transistor pair, said outer terminal sections and said inner terminal section of each transistor pair constituting, respectively, either the source and drain areas or the drain and source areas of the transistors of that pair,

the outer terminal sections of each transistor pair being each overlain by an external channel contact disposed in an accessible from the exterior of the respective marginal region,

each transistor pair being further provided with a common internal channel contact overlying said inner terminal section of that transistor pair in said central region, and

each transistor being additionally provided with an external gate contact disposed in and accessible from the exterior of the respective marginal region, the external gate contacts of two diagonally opposite complementary transistors of said pairs being interconnected by a strip of polycrystalline silicon overlying the associate channel sections and insulatedly intersecting both said buses.

4,595,941

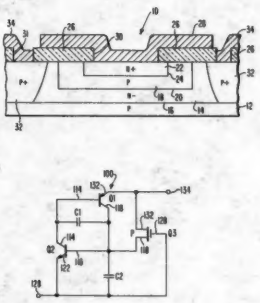
PROTECTION CIRCUIT FOR INTEGRATED CIRCUIT DEVICES

Leslie R. Avery, Flemington, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 616,794, Jun. 4, 1984, abandoned, which is a continuation of Ser. No. 212,534, Dec. 3, 1980, abandoned. This application Jun. 7, 1985, Ser. No. 741,703

Int. Cl.[4] H01L *27/04, 29/78, 29/743;* **H02H** *9/04*

U.S. Cl. 357—43 **7 Claims**



1. A semiconductor structure for the protection of integrated circuit devices, comprising:

(a) a substrate of semiconductor material of a first conductivity type;

(b) a semiconductor layer of a second conductivity type on the substrate, the semiconductor layer having a surface;

(c) a first region of the first conductivity type formed in the semiconductor layer to extend into the semiconductor layer from the surface in order to form a PN junction

between the first region and the adjacent portions of the semiconductor layer;

(d) a second region of the second conductivity type formed in the first region to extend into the first region from the surface in order to form a PN junction between the second region and the first region;

(e) a third region of the first conductivity type extending from the surface through the layer to the substrate, the third region being separated from the first region by a portion of the semiconductor layer which portion extends to the surface;

(f) an insulating layer formed on the surface of the semiconductor layer to extend over the surface between the second region and the third region and which overlies the portion of the first region which extends to the surface as well as the portion of the semiconductor layer which extends to the surface, and at least portions of the second region and the third region on the surface;

(g) first conductive means making direct electrical contact to the third region to form one terminal of the semiconductor structure; and

(h) a second conductive means making direct electrical contact to the second region to form another terminal of the semiconductor structure, the second conductive means extending to and overlapping a portion of the third region and in close proximity to the first conductive means where the first conductive means contacts to the third region.

4,595,942

INTEGRATED CIRCUIT

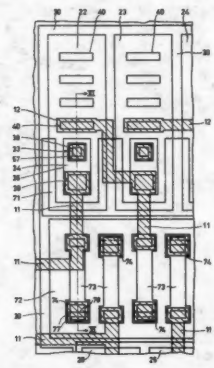
Jan Lohstroh, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,955

Claims priority, application Netherlands, Nov. 17, 1977, 7712649

Int. Cl.[4] H01L *27/04*; H03K *19/091*

U.S. Cl. 357—44 **3 Claims**



1. An integrated logic circuit having a signal input which is formed by a base of a primary bipolar transistor and having a plurality of signal outputs each coupled, through a diode, to the collector of the primary bipolar transistor, the signal input comprising means to supply current, the integrated circuit comprising a semiconductor body having a major surface to which several surface regions of a first conductivity type adjoin which are situated on a common substrate region of a second conductivity type opposite to the first, each of said surface regions being surrounded at the major surface by an isolation zone by means of which the surface regions are isolated electrically from each other at least during operation, one of said surface regions of the first conductivity type serving as a collector zone of the primary bipolar transistor, said primary bipolar transistor furthermore having a major surface-adjoining emitter zone of the first conductivity type which is separated from the collector zone in the semiconductor body by a base zone of the second conductivity type extending up to the major surface and which forms a first P-N junction with said base zone, the base zone forming a second P-N junction with the collector zone, an electrically insulating layer being present on the major surface and having a first aperture which overlies the emitter zone, a second aperture which is situated beside the emitter zone above the base zone and several third apertures which are situated beside the base zone above the collector zone, the insulating layer separating conductor tracks from the semiconductor body which extend into the first, the second and the third apertures for electric connection, the conductor tracks extending into the third apertures being each coupled to the collector zone through a rectifying junction which adjoins the collector zone, said collector zone of the primary bipolar transistor having a high-ohmic and a low-ohmic part, the low-ohmic part extending at and along the interface between the collector zone and the substrate region, the extent of the low-ohmic part of the collector zone in a direction substantially parallel to the major surface being restricted, said low-ohmic part extending below the emitter zone and below the rectifying junctions and terminating at a location which exposes, below the base zone and the overlying second aperture in the insulating layer, a region in which the high-ohmic part of the collector zone directly adjoins the substrate region while forming a third P-N junction, the part of the substrate region adjoining the high-ohmic part of the collector zone cooperating as collector of a vertical auxiliary transistor with the adjoining collector zone and the base zone of the primary bipolar transistor constituting the base and emitter, respectively, of said auxiliary transistor, an electrical connection formed at the part of the substrate region constituting the collector of said vertical auxiliary transistor, a further surface zone of the second conductivity type adjoining the collector zone of the primary bipolar transistor and disposed at the major surface beside the base zone and extending into the semiconductor body from the major surface down to substantially the same depth as the base zone, said further surface zone serving as collector of a lateral auxiliary transistor and being connected to the sbustrate region, the base zone of the primary bipolar transistor at the major surface being surrounded only partly by the further surface zone, the circumference of the base zone situated at the major surface being situated partly opposite to one or more of said third apertures and for the whole remaining part being situated opposite to the further surface zone, whereby if the primary bipolar transistor is overdriven, a considerable part of the current flowing in the base zone of the primary bipolar transistor can flow through the auxiliary transistors and the storage of mobile charge carriers in the overdriven primary bipolar transistor can be restricted considerably.

4,595,943

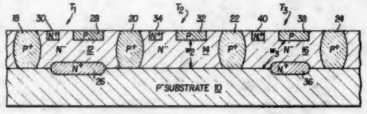
REDUCED BETA VERTICAL TRANSISTORS AND METHOD OF FABRICATION

William R. Morcom, Melbourne Beach, and Jeffrey D. Peters, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 18, 1978, Ser. No. 870,548

Int. Cl.[4] H01L *27/04*

U.S. Cl. 357—48 **18 Claims**



1. In a vertical transistor having a collector region, a base

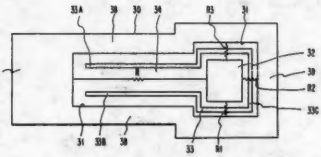
region and an emitter region aligned vertically, the improvement comprising a buried, continuous, high impurity concentration region of the conductivity type of said base region, at the boundary of said base and collector regions and vertically spaced from said emitter region, said buried region being at least coextensive with the area of the vertical projection of said emitter region on said collector region to increase said base width greater than the vertical distance between said emitter and collector regions without reducing the operating range current gain to substantially zero.

4,595,944

RESISTOR STRUCTURE FOR TRANSISTOR HAVING POLYSILICON BASE CONTACTS

Igor Antipov, Pleasant Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,597
Int. Cl.[4] H01L *27/02, 29/06, 27/04*
U.S. Cl. 357—51 **6 Claims**



1. A resistor structure comprising:
a semiconductor layer of a first conductivity type;
a first region of the opposite conductivity type extending a distance into said layer from a surface thereof, said region including first and second sections separated by an intermediate section;
a second region of the first conductivity type extending a distance from said surface into a portion of the intermediate and second sections of the first region; and
a third region of the first conductivity type extending from the second region through the underlying first region thereby electrically separating portions of the intermediate and second sections of the first region interior to said third region from the remainder of the intermediate and second sections of the first region and, thereby, forming an electrically continuous path of the opposite conductivity type between the first section of the first region and the portion of said second section within the third region and contiguous with said portion of the intermediate part within said third region.

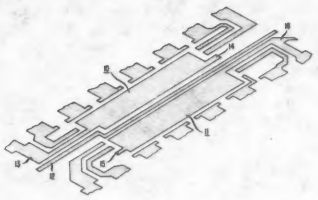
4,595,945

PLASTIC PACKAGE WITH LEAD FRAME CROSSUNDER

Ronald N. Graver, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 21, 1983, Ser. No. 544,420
Int. Cl.[4] H01L *23/48, 23/10*
U.S. Cl. 357—70 **3 Claims**

1. A lead frame device comprising:
a metal lead frame having a central support member and a plurality of leads extending from the vicinity of the central support member outward, a semiconductor chip supported directly by the central support member, conductive members attached from sites on the semiconductor chip to the plurality of leads, and a plastic material commonly encapsulating the semiconductor chip, the central support member, the conductive members, and a portion of each of the plurality of leads, leaving a portion of each of the leads extending beyond the plastic encapsulant,
the invention characterized in that the central support member is segmented into at least two electrically separate portions at least one of which forms a crossunder and extends from beyond one edge of the chip to beyond an opposing edge of the chip, conductive members attached



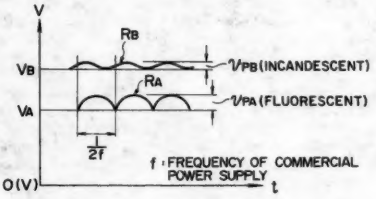
from the chip to each end of the crossunder portion, and insulating means electrically insulating the chip from the central support member.

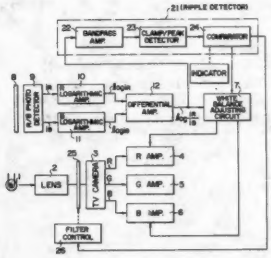
4,595,946

WHITE BALANCE CONTROL SYSTEM INCLUDING A FLUORESCENT LIGHT RIPPLE DETECTOR

Masao Uehara, and Shunpei Tanaka, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Jan. 31, 1984, Ser. No. 575,344
Claims priority, application Japan, Feb. 2, 1983, 58-15687; Oct. 14, 1983, 58-192234
Int. Cl.[4] H04N *9/73*
U.S. Cl. 358—29 **14 Claims**





1. A white balance control system, comprising:
color temperature detecting means for detecting a color temperature of light received thereby from the direction of an object to be imaged and for generating a first output signal as a function thereof, said output signal including a ripple component when said received light flickers, said ripple component being indicative of the magnitude and frequency of the flickering of said received light;
ripple detecting means for detecting said ripple component of said first output signal and for generating a second output signal as a function thereof; and
white balance control means for controlling the gain of

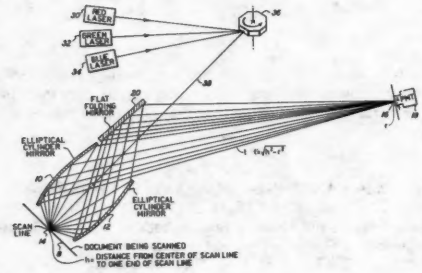
respective color control amplifiers as a function of both said first and second output signals.

4,595,947

LIGHT COLLECTION BY ELLIPTICAL CYLINDER MIRRORS FOR RASTER INPUT SCANNERS

Harry P. Brueggemann, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1983, Ser. No. 544,893
Int. Cl.[4] H04N *1/46, 1/04;* **G02B** *26/08, 5/08*
U.S. Cl. 358—75 **10 Claims**



1. A raster input scanner for collecting the light reflected from a document or other medium repetitively scanned by a moving beam of light along a scan line, the improvement comprising:

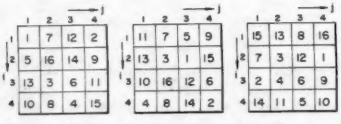
two elliptical cylinder mirror means positioned parallel to and adjacent said scan line, the first of said two elliptical cylinder mirror means being positioned to collect certain of the light reflected from said document or other medium and to reflect said collected light to a focus line positioned away from said first mirror means, the second of said two elliptical cylinder mirror means being positioned to collect certain of the remaining light reflected from said document or other medium and to reflect said collected light to essentially the same focus line as for said first elliptical cylinder mirror means.

4,595,948

MULTICOLOR INK JET RECORDING APPARATUS HAVING MEANS FOR PREVENTING BLURRING OF INK

Tadashi Itoh; Toshiharu Murai, both of Yokohama; Koichiro Jinnai, Kawasaki; Kazumi Ishima, Kashiwa; Takahisa Koike, Tokyo; Toshifumi Kato, Tokyo, and Takao Fukazawa, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,205
Claims priority, application Japan, Oct. 13, 1982, 57-179333
Int. Cl.[4] H04N *1/46;* **G01D** *9/00, 15/18*
U.S. Cl. 358—75 **8 Claims**



1. A multicolor ink jet recording apparatus comprising:

ink jet head means for printing an image by superposing individual dot matrices of at least two colors; and

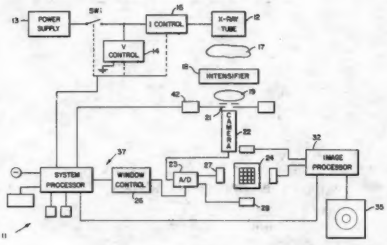
computing means for receiving electrical input signals representing said image and generating and feeding corresponding electrical signals representing said individual dot matrices of said at least two colors to the head means for printing, the computing means comprising matrix generator means for generating said individual dot matrices in such a manner that the total number of dots to be printed in the superposed individual dot matrices is limited to a first predetermined value which is less than the maximum possible total number of dots which can be printed in the superposed individual dot matrices, and in such a manner that the total number of dots to be printed in the superposed individual dot matrices which are formed by superposed dots of different colors is limited to a second predetermined value which is less than said first predetermined value.

4,595,949

SYSTEMS AND METHODS FOR TRANSLATING RADIATION INTENSITY INTO PIXEL VALUES

Paul Fenster; Zvi Netter, and Yair Shimoni, all of c/o Elscint Ltd., P.O. Box 5258, Haifa, Israel

Filed May 29, 1984, Ser. No. 614,839
Claims priority, application Israel, Jul. 26, 1983, 69326
Int. Cl.[4] H05G *1/64, 1/32, 1/50;* **H04N** *5/32*
U.S. Cl. 358—111 **48 Claims**



24. A diagnostic system for automatically substantially simultaneously controlling a plurality of variable parameters governing the translation of detected radiation intensity to pixel values for display images, said system comprising:

means for energizing a source of penetrating radiation to transmit the radiation through an object,

means for detecting on detector means the radiation that has passed through the object and measuring the energy intensity at each location on the detector means,

means for determining the maximum and minimum values of said measured intensity, and

means for using said determined maximum and minimum intensities for adjusting said plurality of variable parameters.

4,595,950

METHOD AND APPARATUS FOR MARKING THE INFORMATION CONTENT OF AN INFORMATION CARRYING SIGNAL

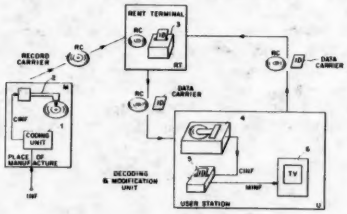
Bo Löfberg, Vindragarvägen 12, S-117 40 Stockholm, Sweden

Continuation of Ser. No. 385,374, filed as PCT SE81/00279, Sep. 25, 1981, published as WO80/01273, Apr. 15, 1982, § 102(e) date May 18, 1982, Pat. No. 4,528,588. This application Dec. 17, 1984, Ser. No. 682,264
Claims priority, application Sweden, Sep. 26, 1980, 8006772; Dec. 23, 1980, 8009138
Int. Cl.[4] H04N *7/167;* **G11B** *15/04;* **G06F** *7/04;* **G07D** *7/00*
U.S. Cl. 358—122 **14 Claims**

1. A method for processing a coded information signal, which coded information signal is transmitted from a signal source to a signal receiver, in order to mark the information content of the information signal and thereby to permit tracing of unauthorized copying of said information signal, the method comprising:

decoding the information signal at a signal receiver during reception;

obtaining an indentification information and unique modification information from a data carrier, said identification information comprising personal identification information in the form of a personal code comprising a bit sequence of a given number of bits;



modifying the decoded information signal receiver by introducing into the decoded information signal said identification information;

said identification information being a characteristic of at least one of said signal receiver and its possessor; and

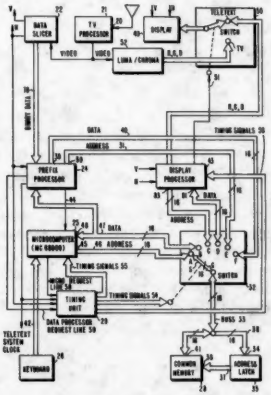
said identification information being introduced into at least one of time and frequency spaces of the decoded information signal such that the information content of said information signal is essentially unchanged.

4,595,951

TELETEXT DECODER USING A COMMON MEMORY

Paul D. Filliman, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1983, Ser. No. 556,353
Int. Cl.[4] H04N *7/087, 7/08*
U.S. Cl. 358—147 **8 Claims**



1. A decoder of teletext-like signals containing picture information for displaying by an imaging device, comprising:

a data processor responsive to said teletext-like signals for generating binary data therefrom;

a display processor for producing signals for said imaging device that contain said picture information;

a microcomputer responsive to said binary data for controlling operation of said display processor;

a memory for storing said binary data;

switching means for providing access to said memory for each of said data processor, display processor and microcomputer to transfer data therebetween, said switching means, when providing access to said memory for one of the data processor, display processor and microcomputer, exclusing the other two from access thereto; and

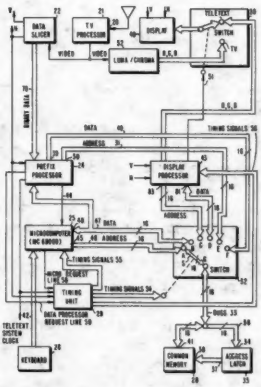
a timing unit for providing timing signals to control said switching means, said timing signals defining a recurring first access time slot wherein access to said memory is provided for said display processor, a recurring second access time slot wherein access to said memory is provided for said microcomputer and a recurring third access time slot wherein access to said memory is provided for said data processor, with the access time slots for said display processor being provided at predetermined time intervals.

4,595,952

TELETEXT DECODER HAVING A REGISTER ARRAY FOR OPERATING ON PIXEL WORDS

Paul D. Filliman, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1983, Ser. No. 556,352
Int. Cl.[4] H04N *7/087, 7/08*
U.S. Cl. 358—147 **6 Claims**



1. A decoder for teletext-like signals containing control information and containing picture information for displaying by an imaging device, comprising:

a data processor responsive to said teletext-like signals for developing binary data therefrom;

a first plurality of memory locations for storing said binary data;

a second plurality of memory locations;

a microcomputer for controlling operation of said decoder, said microcomputer having access to said first plurality of memory locations for reading said binary data obtained from said data processor and having access to said second plurality of memory locations for storing therein pixel data words that said microprocessor derives from said binary data, wherein a given combination of bits of a pixel data word corresponds to a given display information for a pixel defined by said pixel data word; and

a display processor having access to said second plurality of memory locations for reading said pixel data words from said second plurality of memory locations such that the picture information of the corresponding pixels is capable of being displayed in said imaging device, wherein said display processor includes an array of registers for translating the given bit combination assumed by a pixel data word to a color code and to a coexistent transparency code said codes providing display information for a pixel such that both the color and transparency codes associ-

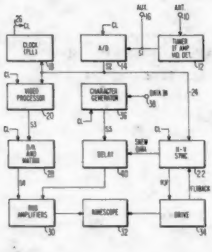
ated with the pixel data word are contained in a corresponding register of said array of registers.

4,595,953

TELEVISION RECEIVER HAVING CHARACTER GENERATOR WITH BURST LOCKED PIXEL CLOCK AND CORRECTION FOR NON-STANDARD VIDEO SIGNALS

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1984, Ser. No. 666,861
Int. Cl.[4] H04N 5/445
U.S. Cl. 358—183 **3 Claims**



1. A television receiver, comprising:

video processing means having an input for receiving a video input signal and an output for providing a processed video output signal;

display means coupled to said processing means for displaying said processed video output signal;

oscillator means responsive to said video input signal for providing a clock signal having a frequency locked to a multiple of the color subcarrier frequency of said video input signal;

character generator means having an output coupled to said display means for supplying a character signal thereto in raster scan form, each line of said character signal comprising a plurality of character elements, said character generator means having a timing clock input terminal coupled to said oscillator means for controlling the timing of said character elements in accordance with said clock signal;

measuring means for providing a skew indicating signal proportional to the time difference between a given transition of said clock signal and a horizontal synchronizing component of said video input signal; and

variable delay means coupled to said character generator means and to said measuring means for effectively imparting delay to said character signal in accordance with said skew indicating signal.

4,595,954

IMAGE SIGNAL REPRODUCTION CIRCUIT FOR SOLID-STATE IMAGE SENSOR

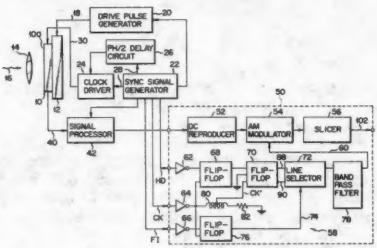
Yukio Endo; Nozomu Harada, and Okio Yoshida, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

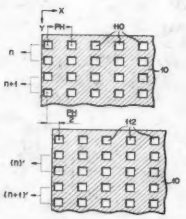
Filed Mar. 20, 1984, Ser. No. 591,491
Claims priority, application Japan, Mar. 23, 1983, 58-48141
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213 **12 Claims**

1. An image signal reproduction device utilized for a specific image sensing system in which a solid-state image sensor swings periodically and relative to an incoming light in synchronization with one frame period to sense the light while displacing to different sampling positions in a plurality of field periods included in one frame period, thereby generating a plurality of field image signals, said image signal reproduction device comprising:

(a) carrier generator means for producing first and second carrier signals having the same frequency as the horizontal readout frequency of said solid-state image sensor and waveforms having peaks respectively coincident to first and second sampling positions of said solid-state image sensor in first and second field periods included in one frame period;

(b) modulator means, connected to said solid-state image sensor and said carrier generator means, for amplitude-modulating the first and second carrier signals in response to the first and second field image signals supplied from said solid-state image sensor to output the first and second amplitude-modulated field image signals;





(c) first signal processing means, connected to said modulator means, for slicing the first and second amplitude-modulated field image signals at a suitable signal level to produce the first and second field image signals having pulse-like shaped waveforms; and

(d) second signal processing means, connected to said first signal processing means, for synthesizing said first and second field image signals to produce an amplitude-modulated frame image signal, which has a waveform having peaks coincident to the first and second sampling positions of said solid-state image sensor, said peaks contributing directly to the resolution of the reproduced image.

4,595,955

ELECTRO-OPTICAL TUBE ALIGNMENT AND BEAM CURRENT ADJUSTMENT

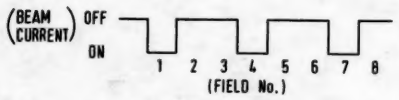
Philip R. Groves, 32, Lynch Hill Park, Whitchurch, Hampshire, and Hugh K. Littlejohn, 19, Guenevere Close, King Arthur's Way, Andover, Hampshire, England

Filed Sep. 9, 1983, Ser. No. 530,983
Claims priority, application United Kingdom, Sep. 9, 1982, 8225702; Sep. 9, 1982, 8225703
Int. Cl.[4] H04N 5/235
U.S. Cl. 358—219 **17 Claims**

1. Apparatus for correcting electron beam alignment comprising monitoring means for monitoring the shading of an

image produced by the tube, adjustment means for decreasing the tube target bias voltage so that a measurable shading is introduced on the tube image, as monitored by the monitoring means, and control means for varying the tube alignment until the monitoring means monitors a minimum average shading.

10. Apparatus for setting beam current of a camera tube



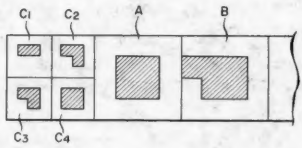
which has a camera tube target having a target charge, comprising adjustment means for adjusting the beam current to discharge the camera tube target for a level of incident light higher than an operational peak light level and switching means for switching the beam off during setting so that the target charge during setting builds up to exceed that produced by the operational peak light level.

4,595,956

IMAGE PROCESSING APPARATUS

Naoto Kawamura, Inagi, and Yukio Masuda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 360,691, Mar. 22, 1982, abandoned. This application Aug. 14, 1984, Ser. No. 640,539
Claims priority, application Japan, Mar. 26, 1981, 56-43186
Int. Cl.⁴ H04N *1/387*
U.S. Cl. 358—283 **21 Claims**



1. An image processing apparatus comprising:

input means for entering pixel data representing image density, a plurality of said pixel data defining a block and all of said pixel data defining a number of said blocks:

discrimination means for discriminating an image state in each said block in accordance with the difference between the image density of the respective pixel data within that block;

output means for outputting image patterns; and

determination means for determining an image pattern to be outputted by said output means and representing each said block on the basis of the result discrimination by said discrimination means.

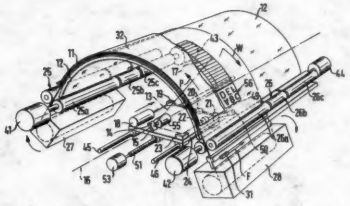
4,595,957

OPTICAL LIGHT BEAD SCANNING ARRANGEMENT

Bernd Holthusen, Hamburg, Fed. Rep. of Germany, assignor to Dr. Boger Photosatz GmbH, Wedel Bei Hamburg, Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,442
Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318311
Int. Cl.⁴ H04N *1/06*
U.S. Cl. 358—290 **15 Claims**

1. Optical light bead scanning arrangement for use in photocomposition apparatus with photosensitive material, the apparatus comprising a modulated laser for generating a modulated laser beam; a holder for the photosensitive material, the holder having the shape of a segment of a cylinder, whereby the photosensitive material in the holder adopts a partially cylindrical shape; a carriage; an optical image forming system and a rotatable mirror arrangement mounted on the carriage by means of which the rotatable mirror arrangement can be displaced with its axis of rotation coaxial to the cylinder axis of the holder along this cylinder axis, and wherein the laser beam, which falls on the rotatable mirror arrangement via the optical image forming system and which is substantially radially directed towards the photosensitive material in the holder after reflection at the rotatable mirror, scans the photosensitive material linewise as a result of rotation of the rotatable mirror and displacement of the carriage along the cylinder axis of the holder, and thereby generates a desired latent pattern in the



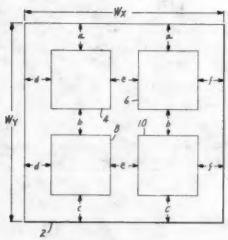
photosensitive material, the laser being also fixedly arranged on the carriage and positioned alongside the rotatable mirror so as to emit light along a first light path being substantially parallel to the axis of rotation of the rotatable mirror, a 90° deflecting mirror being fixedly arranged on the carriage and forming a second light path which is perpendicular to said first light path, a laser modulator fixedly arranged on the carriage in said second light path, a further 90° deflecting mirror fixedly arranged on the carriage forming a third light path which is perpendicular to said second light path and parallel with said first light path, and a correction objective being arranged in said third light path so as to transmit the corrected light beam to said rotatable mirror.

4,595,958

MULTIFORMAT IMAGE RECORDATION

Walter F. Anderson, Jr.; Brian D. Sabo, both of St. Paul, Minn.; Louis R. Poulo, Andover, Mass.; Jan Wissmuller, Arlington, Mass., and Joseph D. Fantuzzi, Lexington, Mass., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 24, 1984, Ser. No. 644,491
Int. Cl.⁴ H04N *1/21, 1/04, 1/46*
U.S. Cl. 358—296 **13 Claims**



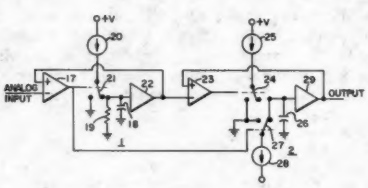
1. A process for recording or projecting a digital image or images in a second format from digital information of an image in a first format where the image is said second format is composed fewer, the same number of or more pixels in a matrix than the image or images in said first format comprising:

(a) providing information on image or images as digital data of a matrix of pixels in a first format,
(b) determining a magnification factor for projection or recordation of an image or images in said second format,
(c) determining the number of pixels that must be added to the matrix of said image in said first format to generate a matrix of said image in said second format,
(d) generating individual pixels of values intermediate those of individual adjacent pixels in the matrix of said first format by linear interpolation,
(e) generating a matrix of digital information of said image in said second format by rational distribution of the generated values of pixels amongst the pixels of the matrix of said first image,
(f) transmitting said matrix of said image in said second format to an imaging means capable of projecting or recording an image in said second format, and
(g) projecting a final image onto an element or material capable of producing a hard copy from the projected final image.

4,595,959
WIDE BANDWIDTH CONSTANT GAIN PEAK DETECTOR

Roger G. Bailey, Lafayette, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Aug. 21, 1984, Ser. No. 642,933
Int. Cl.[4] G11B *5/09, 5/02;* **H03K** *5/153*
U.S. Cl. 360—67 **7 Claims**

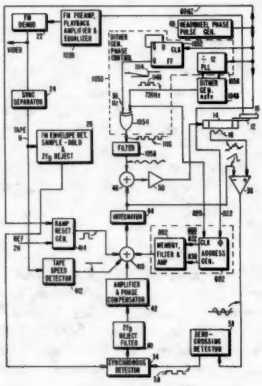


1. A peak detector circuit comprising:
a first current source;
a first capacitor and discharge resistor;
a first comparator, said input signal being applied to one input, the voltage on said capacitor being connected to the other input, said comparator connecting said first current source to said capacitor when said input signal exceeds the voltage on said first capacitor to charge it to each peak voltage of said input signal, said capacitor being discharged through said resistor with a relatively short time constant when current source is disconnected from said first capacitor;
a second current source;
a second capacitor with a relatively long time constant discharge path;
a second comparator, the voltage on said first capacitor being applied to one input of said second comparator, the voltage on second capacitor being applied to the other input of said second comparator, said second comparator connecting said second current source to said second comparator to charge said second comparator to each peak voltage on said first capacitor; and
a third current source, said first comparator connecting said third current source to said second capacitor to rapidly discharge during times when said input signal exceeds the voltage on said first capacitor.

4,595,960
PHASE-REVERSED DITHERED AUTOMATIC SCAN TRACKING SYSTEM

Kaarlo J. Hamalainen, Marlton, and George S. Zorbalas, Cherry Hill, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 3, 1982, Ser. No. 438,793
Int. Cl.[4] G11B *5/58*
U.S. Cl. 360—77 **11 Claims**



1. An automatic scan tracking arrangement for maintianing a playback transducer aligned with a recorded track of an information signal recorded on a record medium, comprising:
a playback transducer;
a servo system cooperating with said playback transducer for scanning in successive scanning intervals at a given scanning repetition frequency a scanning path along said record medium that nomincally follows said recorded track, said servo sytem being subject to mistracking that causes said scanning path to deviate from said recoreded track to produce a transducer output signal that tends to vary in accordance with said mistracking;
scanning path control means coupled to said servo system for controllably varying the scanning path of said playback transducer to said recoreded track;
a dither generator for generating a dither signal, said scanning path control means being responsive to said dither signal for varying said scanning path in accordance therewith, thereby modulating said transducer output signal in accordance with both said dither signal and said mistracking, wherein said transducer output signal is subject to an anomalous modulation unrelated to said mistracking and of such nature as to be repetitive at said scanning repetition frequency;
a detector responsive to the transducer output signal and to a signal representative of said dither signal for detecting the modulation of said transducer output signal, said detector providing a detected signal having an anomalous recurrent component representative of said unrelated, anomalous modulation and that is repetitive at said scanning repetition frequency, and alternating in polarity during alternate ones of said successive scanning intervals;
first feedback means responsive to said detected signal and coupled to said scanning path control means for forming a first degenerative scan tracking feedback loop to develop a first feedback signal for aligning said scanning path with said recorded track; and
second feedback means responsive to said detected signal and coupled to said scanning path control means for forming a second degenerative scan tracking feedback loop having a high gain in narrow bandwidths about a plurality of frequencies, each of said plurality of frequencies being

a multiple of said scanning repetition frequency, to develop a second feedback signal that provides narrowband alignment of said scanning path with said recorded track, said second feedback means including:

a memory having a memory input coupled to said detector and a plurality of storage elements coupled to said memory input and to a memory output;

a write control circuit coupled to said memory and responsive to a memory clocking signal and to a scan synchronized signal representative of the scanning position of said transducer for recurrently storing in each of said plurality of storage elements, during said successive scanning intervals, in accordance with said scan synchronized signal, a corresponding value of said detected signal representing the amount of mistracking present at a corresponding position in successive recorded tracks, whereby corresponding values of the anomalous recurrent component of the detected signal store in said plurality of storage elements cancel one another during alternate ones of said successive scanning intervals; and

a read control circuit coupled to said memory and responsive to said memory clobking and scan synchronized signals for developing said second feedback signal in accordance with the stored detected signal.

4,595,961
HELICAL SCAN TYPE TAPE RECORDING REPRODUCING APPARATUS HAVING A PART-CYLINDRICAL DRUM

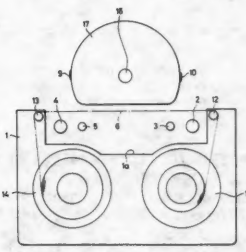
Hideki Kuwajima, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1983, Ser. No. 563,740

Claims priority, application Japan, Dec. 21, 1982, 57-225333; Mar. 30, 1983, 58-55586; Mar. 30, 1983, 58-55587; Mar. 30, 1983, 58-55588; Jun. 6, 1983, 58-101183

Int. Cl.⁴ G11B *15/66, 5/08*

U.S. Cl. 360—85 **8 Claims**



1. A tape recording reproducing apparatus of the helical scan type for use with a tape cassette, said cassette having a recess and means for supporting a section of magnetic tape across said recess, comprising:

a drum assembly comprising a first drum and a second part-cylindrical drum coaxially mounted on a common axis with said first drum and axially spaced therefrom, said second drum being defined by a truncated flat portion and an arc portion which is aligned with the circumference of said first drum, said second drum being rotatable from a first angular position in which said truncated flat portion is in proximity to and in parallel with said section of tape to a second angular position in which said arc portion partially enters the area of said recess;

a rotary yoke carrying a transducer head at each end thereof and coaxially rotating in the space between said drums so that each of the transducers moves along said arc portion;

means for rotating said second drum from said first angular position to said second angular position after said cassette is loaded into said apparatus;

tape loading guide posts located in said recess for loading said tape onto said drum assembly when said second drum enters the area of said recess so that the tape is wound along a part-helical path about said axis.

4,595,962
ADAPTER FOR VIDEO CASSETTE

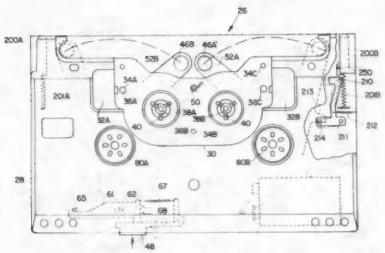
Stephane M. d'Alayer de Costemore d'Arc, Ways, Belgium, assignor to Staar S.A., Brussels, Belgium

Filed Sep. 27, 1982, Ser. No. 424,556

Claims priority, application Belgium, Dec. 1, 1981, 891 313

Int. Cl.⁴ G11B *5/008, 15/00, 17/00;* **G03B** *1/04*

U.S. Cl. 360—94 **24 Claims**



1. A video cassette adapter comprising:

a housing:

means including walls defining a cavity in a face of said housing for receiving a miniature cassette having spools and recording tape extending therebetween normally in a small loop;

guide means movably mounted in said housing and extendible outwardly to an extended position from a retracted position within said small loop for forming a large loop by drawing the recording from tape the spools of a miniature cassette in said cavity with a section of said large loop extending between said spools along a straight elongated path adjacent an edge of said housing and retractible from said extended position to said retracted position while said tape is retracted to the small loop;

hubs rotatably mounted in said housing for access through a face thereof by and for cooperation with spindles of a video apparatus;

means including an intermediate drive connecting said hubs to rotate said miniature cassette spools to transfer recording tape therebetween along said path;

electric motor means in said housing connected to move said guide means between retracted and extended positions; and

take-up means operated by said motor means as incident to retracting said guide means for also rotating a take-up spool of said miniature cassette to retract said recording tape and form a small loop.

4,595,963
FLEXIBLE MAGNETIC DISC DRIVING APPARATUS

Motohiro Shimaoka, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Mar. 8, 1982, Ser. No. 355,376

Claims priority, application Japan, Mar. 6, 1981, 56-32267

Int. Cl.⁴ G11B *5/016, 5/55, 21/22, 21/08*

U.S. Cl. 360—99 **4 Claims**

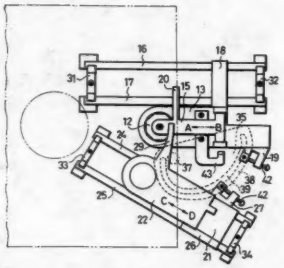
1. A double-sided magnetic disc driving apparatus comprising:

means for receiving and clamping a magnetic disc in a housing, said magnetic disc being placed in a jacket having two windows formed on each side thereof angularly spaced apart

from each other by an acute angle with respect to the center of said disc;

a means for rotating the disc;

two magnetic heads each mounted on respective head mechanisms which are angularly spaced apart from each other correspondingly to said windows, each said mechanism comprising a lower support arm located below the magnetic disc and an upper support arm above the disc, a magnetic head being mounted on one of said upper and lower support arms and an elastic push member being mounted on the other support arm of one mechanism, and a magnetic head and elastic push member being mounted on the support arms of the other mechanism in reverse configuration to said one mechanism,



said mechanisms being located relative to the disc such that each of said heads and push members are placed adjacent the upper and lower surfaces of the disc through said two windows on each side of the jacket of the disc, whereby one head is capable of reading and writing on an upper surface and the other head on a lower surface of the disc,

said head mechanisms each including means for guiding the respective heads and push members translationally over the respective surfaces of the disc a single means for simultaneously driving both heads and push members along their respective guiding means to transduce on both sides of the disc.

4,595,964

MAGNETIC HEAD AND METHOD OF MAKING THE SAME

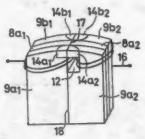
Kazuo Kimura, Yokohama; Kunihide Sakai, Ebina; Chikara Inoue, Hiratsuka; Hiroyuki Hayashi, Rokkakubashi; Toyoaki Takayasu, Tokyo; Yasuhiro Ayabe, and Kayoko Miyake, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jan. 26, 1983, Ser. No. 461,057

Claims priority, application Japan, Jan. 28, 1982, 57-12296

Int. Cl.[4] G11B *5/12*

U.S. Cl. 360—125 **2 Claims**



1. A magnetic head comprising:

two thin metallic magnetic cores held in abutment for defining therebetween a front head gap and a back head gap, a magnetic flux path being provided by the abutted metallic cores from the front head gap to the back head gap;

a pair of magnetic oxide cores sandwiching the metallic cores, each of said magnetic oxide cores including a back head gap aligned in line with said front and back head gaps and a recess at an end thereof;

whereby the combination metallic and oxide cores defines a tape contacting surface including the front gap, said recesses of said oxide cores being exposed on the tape contacting surfaces in the vicinity of the front head gap.

4,595,965

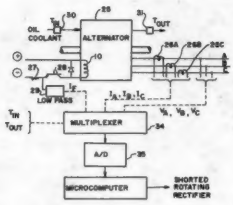
APPARATUS AND METHOD FOR DETECTING A ROTATING RECTIFIER FAULT

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 19, 1983, Ser. No. 563,257

Int. Cl.[4] H02H *7/06*

U.S. Cl. 361—20 **14 Claims**



1. In a brushless alternator having a stationary exciter field winding, a circuit supplying current to said exciter field winding, a rotor with an exciter armature, a rectifier connected with said armature and a main field winding connected with said rectifier and a stator winding in which the alternator output is developed coupled with the main field winding, a rectifier fault detector comprising:

means responsive to the alternator output and to an operating condition of the alternator for developing a signal representing the anticipated exciter field current;

means measuring the actual exciter field current and developing a signal representative thereof;

means comparing said anticipated and actual exciter field current signals; and

means responsive to said comparing means indicating a rotating rectifier fault.

4,595,966

FOR THE PROTECTION OF AN MOS-TRANSISTOR FROM OVERLOADING

Anton Huber, Schwindegg, and Jenö Tihanyi, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,920

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243467

Int. Cl.[4] H02H *3/093*

U.S. Cl. 361—93 **5 Claims**

1. An arrangement for the protection of a switching MOS-transistor (1) having source and drain terminals forming a switching output (120, 130) connected between a load circuit containing a lamp (4) and a DC source (UB), and a gate terminal for switching on the MOS-transistor, comprising:

a control circuit (U1, 8, 5, 7, 6) connected to the gate terminal of the MOS-transistor for producing a switch-on signal for switching on the MOS-transistor,

a zener diode (9) connected between the gate and source terminals of the MOS-transistor for limiting the gate potential and thereby the load current through the drain and source terminals to a predetermined threshold value,

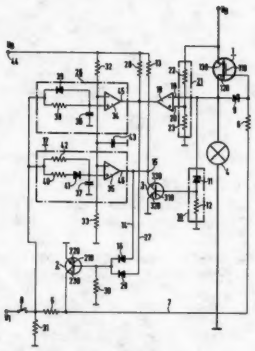
a switch-off transistor (2) connected to the control circuit for rendering inoperative the switch-on signal when the switch-off transistor is switched on,

a first monitoring circuit (10, 3) coupled between the source terminal of the MOS-transistor and the base of the switch-

off transistor for producing a first switch-off signal to switch on the switch-off transistor for as long as the voltage drop at the load circuit is less than a minimum value,

a first coupling diode (16) connected to conduct the first switch-off signal from the first monitoring circuit to the base of the switch-off transistor,

a first timing element (17) connected to the first monitoring circuit which blocks the first switch-off signal for a first predetermined time interval,



a second monitoring circuit (19, 22) coupled between the switching output and the switch-off transistor for producing a second switch-off signal to switch on the switch-off transistor when the voltage at the switching output exceeds a predetermined threshold value,

a second coupling diode (29) connected to conduct the second switch-off signal from the second monitoring circuit to the base of the switch-off transistor, and

a second timing element (26) connected to the second monitoring circuit which blocks the second switch-off signal for a second predetermined time interval.

4,595,967

ELECTRONIC CONTROL CIRCUIT FOR THE PERFORMING OF A MONOSTABLE SWITCHING FUNCTION IN A BISTABLE RELAY

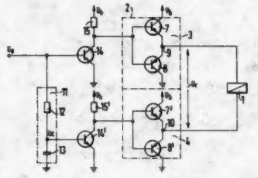
Erwin Potthof, Rothenbach, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Jan. 12, 1984, Ser. No. 570,178

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301866

Int. Cl.[4] H01H *47/32*

U.S. Cl. 361—152 **3 Claims**



1. In an electronic control circuit for the performing of a monostable switching function in a bistable relay through the conversion of binary input signals to control signals, said circuit comprising:

a bistable relay,

a bridge circuit including two bridge branches for reversing the direction of current flow to the relay, each of the bridge branches having two complementary operating electronic switches, said bridge branches act together to alternately apply and remove a voltage potential across the relay in response to a level change in the input signal,

a first of said bridge branches being coupled to an input terminal for said input signal,

a delay circuit coupled between the input signal terminal and a second of said bridge branches for supplying the input signal to said second bridge branch at a predetermined time after the input signal is applied to said first bridge branch

whereby the relay is switched over at each level change in the input signal in response to a voltage pulse supplied to the relay having a time period determined by the delay circuit.

4,595,968

ELECTRONIC FINAL STAGE FOR SWITCHING ELECTRO-MAGNETIC VALVE WITH THE ASSISTANCE OF CONTROLLED CURRENT SOURCE

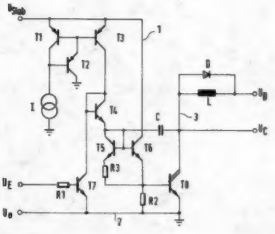
Bernd Kalkhof, Reutlingen, and Horst Lohmüller, Tübingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 31, 1985, Ser. No. 739,961

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423769

Int. Cl.[4] H01H *47/32*

U.S. Cl. 361—152 **8 Claims**



1. Electronic final stage for switching the state of an electromagnetic on-off control device providing an inductive load for a final stage transistor (T8) of said stage, comprising:

a current-controlled current source (T5, T6) connected to supply its output current to the base of said final stage transistor (T8), thereby substantially supplying and controlling the base current of said final stage transistor, and having a control terminal for controlling the current output of said source in response to current supplied to said control terminal, and

a capacitance (C) connected between the collector of said final stage transistor and said control terminal of said current source for providing feedback of a kind giving an integrating characteristic to the circuit of said final stage transistor.

4,595,969

LAMP MOUNTING APPARATUS AND METHOD

Rhett McNair, Anaheim, Calif., assignor to Scientific Component Systems, Inc., Anaheim, Calif.

Continuation-in-part of Ser. No. 645,288, Aug. 29, 1984. This application Mar. 11, 1985, Ser. No. 710,391

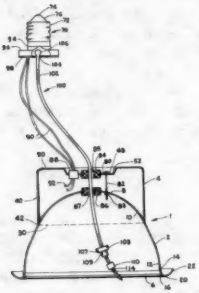
Int. Cl.[4] A47H *1/10*; F21S *3/00*

U.S. Cl. 362—217 **18 Claims**

1. Lamp mounting apparatus comprising:

connection means having elongated means connected to a electrical connector means and extending downward through opening means in a reflector means, gripper means positioned downward of the reflector means being connected to the elongated means and slideable along the

elongated means in an upward direction toward the electrical connector means for gripping the elongated means and force limiting means interposed between the reflector



means and the gripper means for limiting any force exerted on the reflector means upward toward the electrical connector means as the gripper means is slid upward along the elongated means.

4,595,970

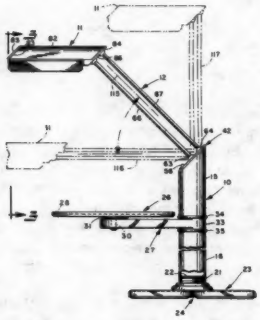
LAMP

Niels Diffrient, Ridgefield, Conn., assignor to Hauserman, Inc., Cleveland, Ohio

Filed Jun. 8, 1984, Ser. No. 618,744

Int. Cl.[4] F21V *21/18*

U.S. Cl. 362—287 **29 Claims**



1. A lamp comprising a pedestal, a horizontally extending light fixture, and fixture supporting means extending between said pedestal and fixture operative to move said fixture through a spherical surface of adjustment while maintaining said fixture horizontal and parallel to itself in any other position of adjustment.

4,595,971

VENTED LUMINAIRE FIXTURE

John R. Dean, Memphis, Tenn., assignor to FL Industries, Inc., Livingston, N.J.

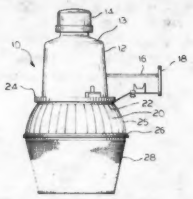
Filed May 6, 1985, Ser. No. 730,653

Int. Cl.[4] F21V *7/20*

U.S. Cl. 362—345 **14 Claims**

1. A lighting fixture comprising an upper housing, a reflector having an upper rim fitted to said upper housing and a refractor fitted to said reflector, wherein:

said upper housing includes a flange overhanging and spaced apart from the rim of the reflector fitted to head casting,



and said reflector includes a plurality of openings on the rim fitted to said upper housing and located under said flange.

4,595,972

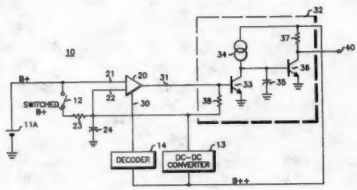
ON/OFF POWER DETECTOR

Walter L. Davis, Coral Springs, and Michael J. DeLuca, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 18, 1984, Ser. No. 683,098

Int. Cl.[4] H02M *3/00*; H04B *1/16*

U.S. Cl. 363—15 **13 Claims**



1. An on/off power detector for a circuit having a voltage source and a switch connected to the voltage source providing a switched output, comprising:

a first input means operatively connected directly to the voltage source,

a second input means operatively connected to the switched output and,

comparator means responsive to voltages on the first and second input means for providing an output signal when the difference between the voltages on the first and second input means exceeds a predetermined amount,

the comparator means including a control input means and is responsive to an enable signal on said control input means for providing said output signal.

4,595,973

SWITCHING POWER SUPPLY

Youichi Masuda, Yokohama, and Toshihiro Onodera, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1985, Ser. No. 712,098

Claims priority, application Japan, Mar. 19, 1984, 59-52807

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—18 **8 Claims**

1. A switching power supply comprising:

a DC power source;

a power transmitting transformer having primary and secondary windings for transmitting electric power from the primary side to the secondary side;

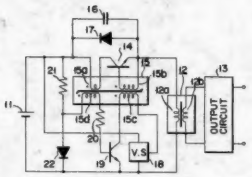
rectifying means, connected to the secondary winding of said power transmitting transformer, for transforming an output appearing on the secondary side of said transformer to a direct current;

a saturable transformer having first to fourth windings, said

first winding being inserted in series in a first power supply path from said DC power source to said primary winding of said power transmitting transformer;

main switching means for opening or closing said first power supply path, said main switching means being inserted in said first power supply path so as to be connected in series to said first winding of said saturable transformer and being controlled by an output of said second winding of said saturable transformer and being provided in a manner such that the saturable transformer acts as a positive feedback system through said first and second windings;

a resonance capacitor which is connected in parallel to a series circuit consisting of said main switching means and said first winding and causes the resonance between an



exciting inductance of said power transmitting transformer and said resonance capacitor;

an auxiliary power source for generating a predetermined direct current output to drive said third winding of said saturable transformer by a polarity opposite to that of said first winding; and

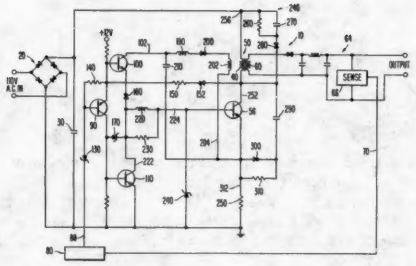
auxiliary switching means, inserted in series in a second power supply path from said auxiliary power source to said third winding of said saturable transformer, for opening or closing said second power supply path, said auxiliary switching means being controlled by an output of said fourth winding of the saturable transformer and being provided in a manner such that said saturable transformer acts as a positive feedback system through said third and fourth windings.

4,595,974

BASE DRIVE CIRCUIT FOR A SWITCHING POWER TRANSISTOR

Patrice R. Lethellier, Tamarac, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 10, 1984, Ser. No. 649,071
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—21 **11 Claims**



1. A base drive circuit for use in a switching-type power supply comprising:

first and second transistors each having an emitter, a collector and a base electrode,

the base electrode of said first transistor being coupled to the emitter electrode of said second transistor via a first current path, the base electrode of said second transistor being coupled to a bias voltage source, the collector electrode of said first transistor being coupled to said base electrode of said second transistor via a second current path,

means coupled to said second transistor for causing said last mentioned transistor to selectively assume a conducting and nonconducting state, said first transistor being responsive to the state of conduction of said second transistor whereby said first transistor is caused to assume a like state of conduction,

the conduction of said second transistor causing current flow via said first current path to the base of said first transistor thereby determining the degree of conduction of said first transistor,

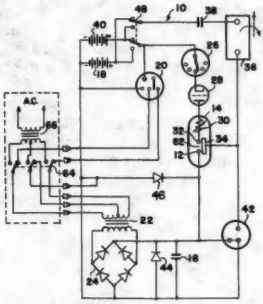
said second current path including a unidirectional current conducting device poled to permit current to flow in said last mentioned path when the potential on the collector electrode of said first transistor falls below a predetermined value consistent with the desired level of saturation current in said first transistor, the current flow in said second current path effecting a diminution of said current flow in said first current path thereby reducing the current flow in said first transistor to said desired level.

4,595,975

EFFICIENT POWER SUPPLY SUITABLE FOR INDUCTIVE LOADS

Edwin V. Gray, Sr., P.O. Box 362, Council, Id. 83612

Filed Oct. 18, 1984, Ser. No. 662,339
Int. Cl.[4] H02M 3/42
U.S. Cl. 363—33 **8 Claims**



1. An electrical driving system comprising:

a source of electrical voltage;

a vibrator connected to said source for forming a pulsating signal;

a transformer connected to said vibrator for receiving said pulsating signal;

a rectifier connected to said transformer having a high-voltage pulse output;

a capacitor for receiving said voltage pulse output;

a conversion switching element tube having first and second anodes, electrically conductive means for receiving a charge positioned about said second anode and an output terminal connected to said charge receiving means, said second anode being connected to said capacitor;

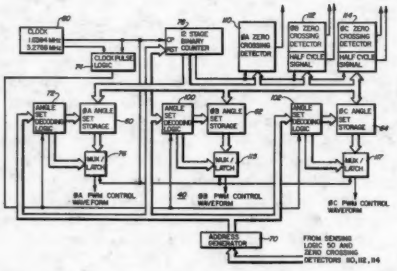
a commutator connected to said source of electrical voltage and to said first anode; and

an inductive load connected to said output terminal whereby a high energy discharge between said first and second anodes is transferred to said charge receiving means and then to said inductive load.

4,595,976
INVERTER CONTROL

Robert C. Parro, II, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 27, 1984, Ser. No. 686,985
Int. Cl.[4] H02M 1/12
U.S. Cl. 363—41 **15 Claims**



1. An inverter control for developing operating signals for switches in an inverter to produce an output in accordance with a control signal, comprising:

a memory having a plurality of memory blocks, each memory block storing a series of bytes each comprising a number of bits which may be either a zero or a one, a zero representing a first output condition and a one representing a second output condition;

decoding logic coupled to the memory for accessing a particular memory block based upon the control signal;

a clock for generating a series of clock pulses;

means coupled between the clock and the memory for sequentially addressing the bytes within the accessed memory block as the clock pulses are generated so that such bytes are sequentially provided at an output of the memory;

a multiplexer/latch coupled to the memory output and responsive to the control signal for latching a particular bit of each provided byte so that a control waveform is developed at an output thereof; and

means coupled to the multiplexer/latch for deriving the operating signals from the control waveform so that an output is produced which assumes the first and second output conditions.

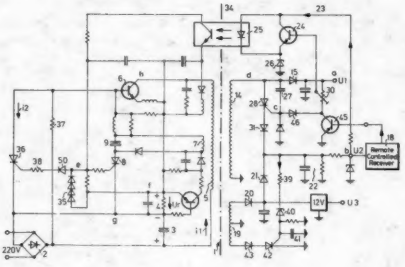
4,595,977
SWITCHED MODE POWER SUPPLY

Wilfried von der Ohe, Springe, Fed. Rep. of Germany, assignor to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 671,044
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341074
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 **14 Claims**

1. In a switched mode power supply including a rectifier having input terminals for connection to an alternating voltage supply; a separating transformer having at least one main primary winding and at least one secondary winding; an output current regulated oscillator circuit connected to d.c. terminals of said rectifier, with said oscillator including a switching transistor having its emitter-collector path connected in series with said main primary winding and serving to periodically turn the primary current in said primary winding on and off; first protective circuit means connected to said switching transistor for normally limiting said primary current to a first predetermined value; and

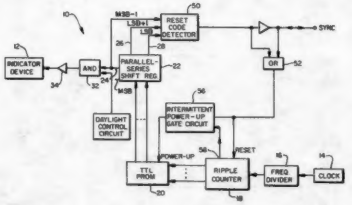
circuit means, including at least one rectifier and connected to said at least one secondary winding, for providing a d.c. operating voltage at an output terminal of said power supply; the improvement comprising: a second protective circuit means for limiting said primary current to a second predetermined value, which is greater than said first predetermined value, upon nonoperation of said first protective circuit means, said second protective circuit means including a thyristor connected between the base of said switching transistor and a circuit point providing a blocking voltage for said switching transistor, and second circuit means, including a threshold device, for connecting the control electrode of said thyristor to a point of reference voltage proportional to said primary current via said threshold device; further comprising: a third protective circuit means connected to said secondary winding for limiting said d.c. operating voltage, when said operating voltage rise to a limit value.



4,595,978
PROGRAMMABLE CONTROL CIRCUIT FOR CONTROLLING THE ON-OFF OPERATION OF AN INDICATOR DEVICE

Herman E. Sheffield, Houston, Tex., assignor to Automatic Power, Inc., Houston, Tex.

Continuation of Ser. No. 429,008, Sep. 30, 1982, abandoned. This application Oct. 2, 1985, Ser. No. 797,171
Int. Cl.[4] G05B 19/04; G08B 5/31
U.S. Cl. 364—141 **24 Claims**



1. A programmable control circuit for controlling the on-off states of an indicator device comprising:

a memory circuit having a plurality of memory cells programmed with a plurality of code words indicative of a desired on-off sequence to be provided by the indicator device;

an addressing means coupled to said memory circuit for generating address words to address said memory cells of said memory circuit to activate said memory circuit to output said code words in parallel format in accordance with said address words;

a parallel-to-series conversion means coupled to receive said parallel format code words from said memory circuit and

to convert said parallel format code words to a serial code output signal;

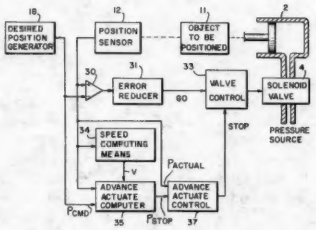
output means coupled to receive said serial code output signal from said parallel-to-series conversion means and to drive said indicator device in accordance with said serial code output signal, and

an intermittent power-up circuit coupled to said memory circuit for powering-on said memory circuit only during periods necessary to permit addressing said memory circuit and transferring said parallel format code words from said memory circuit to said parallel-series conversion means.

4,595,979
POSITIONING APPARATUS USING A HYDRAULIC ACTUATOR

Kenji Arai, Ogawa; Masaharu Inamo, Kawagoe, and Kazumasa Kurihara, Meiwa, all of Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Apr. 6, 1983, Ser. No. 482,578
Claims priority, application Japan, Apr. 7, 1982, 57-56538
Int. Cl.[4] F16K *31/02, 31/122;* **G05D** *3/00;* **G05B** *15/00*
U.S. Cl. 364—174 **8 Claims**



1. A position control apparatus comprising a hydraulic actuator operatively connected with an object to be positioned and a valve unit which is located between said hydraulic actuator and a hydraulic pressure source for controlling the driving/-stopping operation of said hydraulic actuator and has at least one solenoid valve responsive to an electric signal for controlling the hydraulic pressure supplied to said hydraulic actuator, said object being positioned at a desired position by the operation of said solenoid valve, said apparatus further comprising:

means for producing a first signal relating to the position of said object at each instant;

means for producing a second signal relating to a desired position at which said object is to be positioned;

first means responsive to the first and second signals for determining the difference between the actual position and the desired position of said object;

second means responsive to the result of said first means for controlling the open/close state of said solenoid valve so that said hydraulic actuator is driven in the direction for making the difference smaller;

first computing means responsive to the first signal for producing first data indicating the speed of movement of said hydraulic actuator;

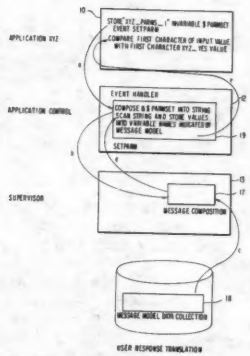
second computing means responsive to at least the first signal, the second signal and the first data for computing second data indicating the position of said object at which the operation of said solenoid valve for stopping the driving of said hydraulic actuator is to be carried out in order to position said object at the desired position; and

third means responsive to the second data and the first signal for operating said solenoid valve so as to stop the operation of said hydraulic actuator when said object actually reaches the position indicated by the second data.

4,595,980
INTERACTIVE DATA PROCESSING SYSTEM HAVING CONCURRENT MULTI-LINGUAL INPUTS

John G. Innes, Arlington, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 27, 1983, Ser. No. 517,642
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—200 **6 Claims**



1. A method of providing a distrubuted, interactive data processing system with concurrent multi-lingual use by a plurality of users having different national language preferences, said method making said interactive data processing system independent of the national language in which a user input is received, comprising the steps of:

establishing a message model data collection by storing message models via a message identifier primary key that is common to all languages and a secondary key that is a national language index which indicates the national language preference;

using a central message service to compose messages from message models received from said message model data collection using said primary and secondary keys in response to a call from a calling program and communicating the composed messages to users in their national language preference;

said calling program initially storing a message identifier primary key as the value of a relevant variable;

obtaining a message model whose name is stored in the variable by determining a current user's national language preference and, using said secondary key, obtaining a message model corresponding to said secondary key from said meassage model data collection as the first mentioned message model whose name is stored in the variable, and storing a composed message based on said message model in said variable;

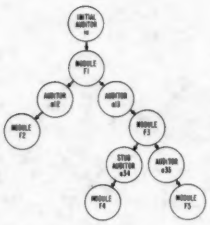
parsing said message model to find variable names and values to be stored for those variables whereby the variable names are common to all languages and the values are dependent upon the current user's natural language preference, then assigning said values to the found variable names;

said calling program then using the values stored in said variables to determine whether the user's input has meaning recognized by the calling program.

4,595,981
METHOD OF TESTING INTERFACES BETWEEN COMPUTER PROGRAM MODULES

Wu-Hon F. Leung, Downers Grove, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 5, 1984, Ser. No. 586,291
Int. Cl.[4] G06F 9/06
U.S. Cl. 364—300 18 Claims



1. A method of operating a digital computer to test an interface between a first program module and a second program module, each of said first and second program modules having associated input variables and an associated cause/effect chart comprising a plurality of cases each having an input condition comprising values of input variables, said method comprising

initiating the execution of said first program module,

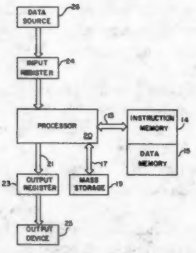
suspending the execution of said first program module at a point where said first program module calls said second program module and

verifying that the values of those input variables associated with said second program module that are defined at the time the execution of said first program module is suspended, are consistent with the input condition of at least one of the cases of the cause/effect chart associated with said second program module.

4,595,982
EXPERT SYSTEM AND METHOD FOR MAKING DECISIONS IN ACCORDANCE WITH THE DECISIONS OF A MENTOR

Frank N. Burt, 2178 Coach Way, Bloomfield Hills, Mich. 48013

Filed Sep. 2, 1983, Ser. No. 529,081
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—300 14 Claims



1. A method for making decisions within a problem sphere comprising the steps of:

(a) defining the logical sphere of the problem by capturing descriptive information according to parameters supplied by an expert who acts as a mentor;

(b) characterizing each unique situation in terms of intermediate judgments about each parameter so defined;

(c) assessing the relative logical and experiential importance of each intermediate judgment;

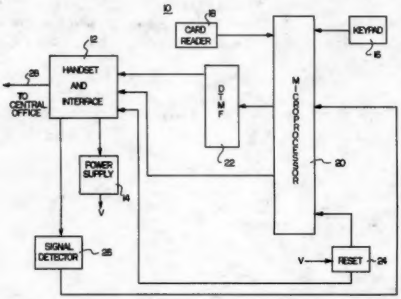
(d) subdivding the intermediate judgments into classes of major importance and minor importance;

(e) identifying a presented example as being logically identical to previously encountered situations in a given fraction of its intermdiate judgments.

4,595,983
CENTRAL OFFICE POWERED CREDIT ONLY TELEPHONE PAYSTATION

David J. Gehalo, Richardson, and Thomas M. Fisher, Plano, both of Tex., assignors to Reliance Electric Company, Cleveland, Ohio

Filed Oct. 27, 1983, Ser. No. 545,786
Int. Cl.[4] G06F 15/22, 15/24; G06K 15/00; H04M 17/02
U.S. Cl. 364—401 32 Claims



25. A credit only telephone paystation having handset and interface means including a transmitter means and a hookswitch for connecting said paystation to a central office by transmission means, said central office being the only and a limited source of power for operating said paystation and providing said limited power to said paystation over said transmission means only when said hookswitch is closed, said paystation comprising:

(a) power supply means which responds to the providing of power from said central office by generating a voltage;

(b) information entering means activated by said voltage for reading encoded credit information inserted therein by a user of said paystation and providing in response thereto a first output signal and for allowing said user to enter dialing information and providing in response thereto a second output signal, said credti information represnting the number of a credit account to which any telephone calls placed by said user shall be charged;

(c) readable nonvolatile storage means having stored therein a plurality of nonrestricted telephone numbers which may be dialed by said user without having to insert encoded credit information in said information entering means; and

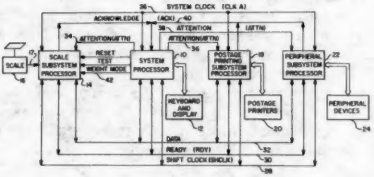
(d) control means, said control means being inactive and being reset and activated by said voltage, said control means being connected to both said information entering means providing, in response to said information entering means first and second output signals, signals representative of said dialing information and said credit information to said interface means for connection to said central office, said control means also providing to said handset and interface means a signal to turn off said transmitter means at all times other than when said control means has determined that said user has dialed a complete telephone number to thereby allow said paystation to operate solely on said central office power, said control means receiving said plurality of nonrestricted numbers from said storage means and including means which responds to said information entering means second output signal to determined when said user has dialed one of said plurality of nonre-

stricted numbers and for transmitting said dialed nonrestrictive number to said handset and interface means.

4,595,984
APPARATUS AND METHOD FOR DETERMINING SPECIAL POSTAGE FEES

Edward P. Daniels, Bridgeport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 22, 1982, Ser. No. 436,123
Int. Cl.[4] G06F *15/20, 15/30*
U.S. Cl. 364—466 **17 Claims**



1. An apparatus for determining postage for items to be mailed, comprising:

(a) means for determining the weight of said items;

(b) data entry means for entering data necessary to determine the postage value applicable to said items, said data including data defining special fees, if any, applicable to each of said items;

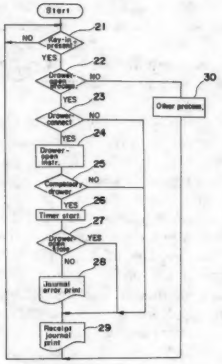
(c) processor means operatively associated with said weight determining means and said data entry means, for determining the postage value applicable to each of said items, said processing means further comprising memory means for storing first tables of data defining base postage rates, and second tables defining special fee rates said special fees including dollar value oriented special fees which are determined in accordance with an entered dollar value, and said second tables including two section tables defining special fee rates for dollar value oriented special fees determined in accordance with entered dollar values which may be greater than a predetermined amount, said two section tables comprising a lower section defining special fee rates for entered dollar values ranging up to and including said predetermined amount in unit increments and an upper section defining special fee rates for entered dollar values ranging up from said predetermined amount in increments greater than unity; and

(d) said processor means responding to said determined weights and applicable entered data to select a base postage value for each of said items, and responding to said determined weights and said entered data, as applicable, to select special fee values for each of said items to which such special fees apply, and said processor adjusting said base postage values in accordance with said selected special fee values, if any, and outputing said adjusted values, and wherein, in selecting such special fee values, and said processor responds to said entered data, as applicable, to select, when appropriate, dollar value oriented special fee values determined in accordance with an entered dollar value which may be greater than said predetermined amount from said two section tables for each item to which said so determined special fee vaiues apply, said processor selecting such appropriate special fee values from said lower sections for entered dollar values less than or equal to said predetermined amount based on such dollar value as entered, and said processor selecting such appropriate special fee values from said upper section for entered dollar values greater than said predetermined amount, based on such entered dollar values as appropriately rounded.

4,595,985
ELECTRONIC CASH REGISTER

Yoshifumi Sakakiya, Nagaokakyo, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 16, 1983, Ser. No. 523,588
Claims priority, application Japan, Aug. 25, 1982, 57-148426
Int. Cl.[4] G06F *15/30*; G07D *1/06*; G08B *13/02*; G07C *5/00*
U.S. Cl. 364—405 **5 Claims**

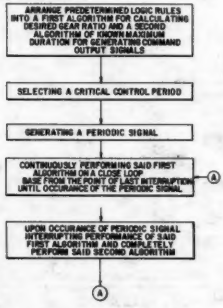


1. An electronic cash register which comprises a transaction determining means which determines that a predetermined operation is correctly performed and outputs an open instruction to open a cash drawer of the cash register, a detecting means for detecting the opening of the cash drawer, a warning means providing a warning signal, and a controlling means for actuating said warning means when said detecting means does not detect the opening of the cash drawer within a predetermined period of time after output of the open instruction by the transaction determining means.

4,595,986
METHOD FOR CONTROL OF AUTOMATIC MECHANICAL TRANSMISSION SYSTEM UTILIZING A MICROPROCESSOR BASED ELECTRONIC CONTROLLER

Ronald E. Daubenspeck, Indianapolis, Ind.; Robert R. Smyth, Bloomfield Hills, and Donald Speranza, Canton, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 9, 1984, Ser. No. 659,114
Int. Cl.[4] B60K *41/00*
U.S. Cl. 364—424.1 **14 Claims**


ARRANGE PREDETERMINED LOGIC RULES INTO A FIRST ALGORITHM FOR CALCULATING DESIRED GEAR RATIO AND A SECOND ALGORITHM OF KNOWN MAXIMUM DURATION FOR GENERATING COMMAND OUTPUT SIGNALS
SELECTING A CRITICAL CONTROL PERIOD
GENERATING A PERIODIC SIGNAL
CONTINUOUSLY PERFORMING SAID FIRST ALGORITHM ON A CLOSE LOOP BASE FROM THE POINT OF LAST INTERRUPTION UNTIL OCCURANCE OF THE PERIODIC SIGNAL
A
UPON OCCURANCE OF PERIODIC SIGNAL INTERRUPTING PERFORMANCE OF SAID FIRST ALGORITHM AND COMPLETELY PERFORM SAID SECOND ALGORITHM
A

1. An improved method of controlling a vehicle automatic mechanical transmission system comprising a throttling device

controlled engine, and operator actuated throttle position indication device, a multi-speed jaw clutch type change gear transmission, a nonpositive coupling device drivingly interposed the engine and the transmission and actuators responsive to command signals for controlling the status of said throttling device, coupling device and transmission, said method including utilizing a digital microprocessor based electronic control unit for processing current and stored inputs in accordance with predetermined logic routines to determine desired engaged ratio of the transmission and to generate command outputs to said actuators, said control unit having means to receive inputs indicative of at least transmission input shaft speed, transmission output shaft speed, engine speed and operator actuated throttle position and means to condition and store said input information;

said improved method comprising the steps of:

selecting a critical control period based upon the rates of response of said throttling device, coupling device and transmission actuators and the frequency of adjusting said actuators required to assure the speed of said vehicle engine will not vary during said critical control period by greater than a predetermined nominal value;

arranging said predetermined logic routines into a first alogorithm routine and a second algorithm routine, said microprocessor in said first algorithm routine processing current inputs to provide a processed output signal indicative of the desired engaged ratio of the transmission, said microprocessor in said second algorithm routine processing said then current input signals, including said processed output signal, to generate output signals, including command output signals to said actuators, independently of previously processed input and generated output signals;

providing performance logic rules for said microprocessor wherein said microprocessor performs said first algorithm routine on a continuous loop basis and is responsive to a periodic signal to interrupt performance of said first algorithm routine to completely perform said second algorithm and then to resume performance of said first algorithm routine from the point of interruption;

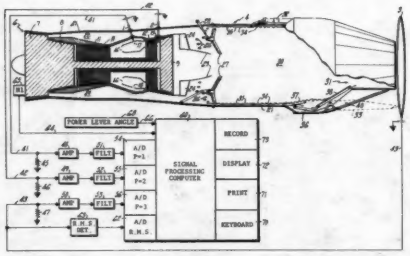
generating said periodic signal at a frequency sufficient to cause at least two interruptions of said first algorithm and complete executions of said second algorithm during said critical control period.

4,595,987

CONTIGUOUS EVENT DISCRIMINATION IN ELECTROSTATIC ENGINE DIAGNOSTICS

Philip E. Zwicke, South Glastonbury; David M. Rosenbush, Granby, both of Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,118
Int. Cl.[4] G01M *15/00*
U.S. Cl. 364—431.02 **2 Claims**



1. Electrostatic diagnostic apparatus for distinctly correlating different events occurring in an operating gas turbine engine, comprising:

electrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having a waveshape defined by amplitude variations thereof across a time interval of a given duration in response to electrostatic charge flowing in the gas stream in the vicinity of said probe;

an analog to digital converter connected for response to said electrostatic signal means; and

signal processing means connected to said analog to digital converter

(a) for causing said analog to digital converter to sample the probe signal provided by said electrostatic signal means in a manner to provide a record of digital signals indicative of the amplitude variations thereof defining the waveshape thereof,

(b) for storing, in response to the amplitude of one of said digital signals being in excess of a threshold magnltude, a record comprising a contiguous sequence of said digital signals sufficient to define the waveshape of said probe signal, repetitively, to provide a classification group consisting of a given number of said records,

(c) for providing a contiguous signal based on a plurality of records in said group each containing one of said digital signals which are contiguous to one of said digital signals contained in another one of said records,

(d) for classifying said records in accordance with characteristics of the waveshapes thereof individually in the case of records not identified as contiguous by said contiguous signal, and

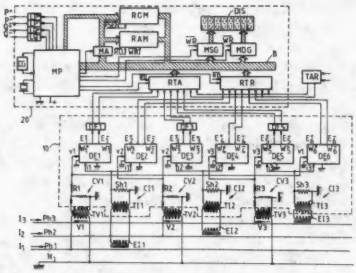
(e) for classifying said plurality of records identified as contiguous by said contiguous signal as an individual record in accordance with characteristics of the waveshapes thereof.

4,595,988

ELECTRONIC METER FOR MEASURING ACTIVE AND REACTIVE ENERGIES IN A THREE-PHASE NETWORK

Alain Chiffert, Poitiers; William Galula, Montrouge, and Michel Rousseau, Malakoff, all of France, assignors to Enertec, Montrouge, France

Filed Oct. 19, 1983, Ser. No. 543,643
Claims priority, application France, Oct. 20, 1982, 82 17579
Int. Cl.[4] G01R *21/06*
U.S. Cl. 364—483 **10 Claims**



1. An electronic meter for measuring active and reactive energy on a three-phase network comprising:

a plurality of current and voltage converters responsive to the currents and voltages, respectively, flowing in each line of said network and for generating signals representative thereof;

a plurality of single-phase energy sensors responsive to each of the signals generated by the current and voltage con-

verters for generating pulses representative of the active and reactive energy flowing through each of the lines;

means for determining the direction of flow of energy through each of the lines; and

at least first and second pulse accumulating means, responsive to the means for determining the direction of flow of energy, for accumulating the pulses generated by the energy sensors such that the net number of accumulated pulses accumulated by the first pulse accumulation means is representative of the active energy flowing in the network and the net number of accumulated pulses accumulated by the second pulse accumulating means is representative of the reactive energy flowing in the network.

4,595,989

POINT MEASURING PROCESS FOR PRESET ROBOT

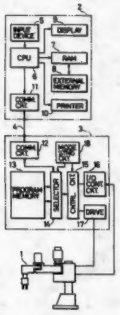
Kazuyoshi Yasukawa, and Yoshio Hayashi, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Sep. 23, 1982, Ser. No. 422,507

Claims priority, application France, Oct. 5, 1981, 81 158477

Int. Cl.[4] G05B *19/42, 19/18;* B25J *9/00*

U.S. Cl. 364—513 **5 Claims**



1. A method of programming a robot, said robot being of the type including: a programming unit for generating a final program defining a movement path including a plurality of positions to which a robot element is to be moved, said programming unit including input means for operator input of coordinate data corresponding to said plurality of positions; a robot control unit for storing said program and for providing said program as a control output for moving said robot element; movement means for moving said robot element in accordance with said control output; and sensing means for sensing the position of said robot element and for providing a position signal representing the coordinate data corresponding to the sensed position, said method comprising the steps of:

moving said robot element to at least one position desired as one of said plurality of positions;

generating via said sensing means a position signal representing the correct coordinate data corresponding to said at least one position; and

generating said final program using said correct coordinate data.

4,595,990

EYE CONTROLLED INFORMATION TRANSFER

Richard L. Garwin, Scarsdale, and James L. Levine, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

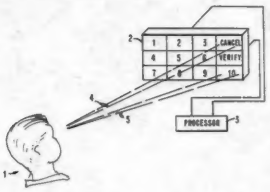
Continuation of Ser. No. 221,660, Dec. 31, 1980, abandoned. This application Mar. 31, 1983, Ser. No. 480,992

Int. Cl.[4] G06F *15/40, 15/626*

U.S. Cl. 364—518 **1 Claim**

1. In a user-machine visual communication device of the type involving displayed data wherein a user indicates by the location of the gaze of said user on a partitioned display a proposed machine action and said machine executes said action based on a verificatin from said user of a displayed indication of that proposed action, the improvement comprising:

means for said machine to indicate a proposed interpretation of said user gaze movement derived from the parameters



of gaze location points, time and frequency of occurrence by locally changing the intensity of a portion of said displayed data, and

means for detecting in a specific location of said displayed data assigned for a verification signal concerning the information conveyed by said locally changing the intensity of a portion of said displayed data, the presence of the gaze location of said user.

4,595,991

POSITION MEASURING METHOD AND APPARATUS

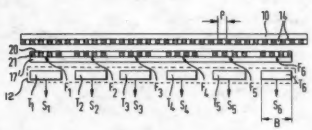
Alfons Spies, Seebruck, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,368

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239108

Int. Cl.[4] G01C *3/08*

U.S. Cl. 364—525 **13 Claims**



1. A method for generating harmonic-free periodic signals in an incremental or absolute measuring system comprising a scale which defines a graduation having a period P and a scanning unit which generates at least one scanning signal and scans the scale, said method comprising the following steps:

determining a band width N characteristic of the at least one scanning signal;

providing at least 2N scanning elements in the scanning unit to scan the period P of the graduation, each of which generates a respective scanning signal S_n in response thereto;

performing a Fourier analysis on the scanning signals to determine at least a pair of Fourier coefficients a_1, b_1; U_a, U_b . . . characteristic of a lowest frequency Fourier component of the at least one scanning signal; and

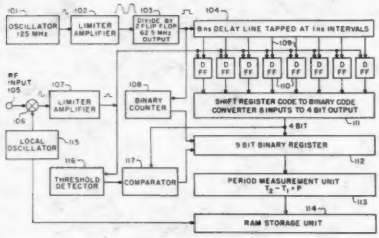
determining by means of an evaluation unit the position of the scanning unit with respect to the scale from an evaluation of the at least a pair of Fourier coeffients a_1, b_1; U_a, U_b . . . as harmonic-free periodic signals.

4,595,992

ENCODING AND DECODING DEVICE FOR NARROW BANDWIDTH COHERENT SIGNALS

Edwin M. Drogin, Dix Hills, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 7, 1982, Ser. No. 385,900
Int. Cl.[4] G01R 23/00; G04F 10/04
U.S. Cl. 364—569 8 Claims



1. Apparatus for accurately determining the period of a signal to be measured, and for digitally encoding and storing the period information, where only one-half period of the signal to be measured need be supplied and the minimum number of bits are required for storing said information, comprising:

(a) a Clock Signal Source where the clock frequency exceeds that of the signal to be measured,

(b) a Tapped Delay Line having an input port and a plurality of taps for output ports where the taps are at intervals along the line which are a fraction of the clock frequency period, the Delay Line receiving at its input port the clock signal,

(c) a plurality of Means for Switching, each having two input ports and one output port, and each switching state at the coincidence of two input signals, each input signal being supplied to separate input ports, the means for switching remaining in the switched state until reset, one of each such means for switching being provided for each tap on the Delay Line and each being connected to receive a signal from its respective tap at its first input port, and each also being connected to receive the signal to be measured at its second input port,

(d) a Counter having an input port and an output port and being connected to receive at its input port the clock signal,

(e) a Shift-Register-Code-To-Digital-Code-Converter, referred to as the Code Converter, said Code Converter being connected to receive from the output port of each Means for Switching an indication of the state of each, and convert all such indications to a digital code representing the position of the clock signal on the Tapped Delay Lines after the Means for Switching have been switched,

(f) a Digital Register connected to receive as inputs the output of the Code Converter and the output of the Counter and to combine and temporarily store both, the combined inputs to the Digital Register representing an accurate time of occurrence measurement of a leading edge of the signal to be measured, with the Counter output constituting a time measurement accurate to one clock period, and the position of the clock signal on the Delay Line at the time of coincidence, as indicated by the states of the Means for Switching, constituting a measurement of the time of occurrence of a leading edge of the signal to be measured accurate to the time interval between delay line taps,

(g) a Period Computing Means connected to the Digital Register to receive and store the time of occurrance of a first and a second coincidence of input signals to the Means for Switching and subtract the two to provide a measurement of the period of the signal to be measured, and

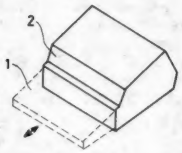
(h) Means For Storing connected to the Period Computing Means to receive and store the measured period of the signal to be measured.

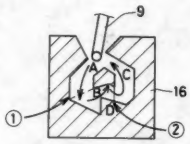
4,595,993

MANUALLY RECIPROCATIVE SECTION OF AN ELECTRONIC APPARATUS

Keiji Yao, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1983, Ser. No. 495,162
Claims priority, application Japan, May 20, 1982, 57-86297
Int. Cl.[4] G06F 1/00; G21H 1/00; H05K 7/16
U.S. Cl. 364—708 4 Claims





1. An electronic apparatus comprising

a housing,

a reciprocative section mounted in said housing for reciprocating movement into and out of said housing,

spring means for continuously urging said reciprocative section in a first direction,

lock means for locking said reciprocative section to said housing,

said lock means comprises a lock lever secured to said housing and an engagement unit secured to said reciprocative section,

a cavity located in said engagement unit, said cavity having an opening for receiving said lock lever and surface means for engagement with said lock lever,

a projection having first, second, third and fourth sides positioned in said cavity surface and means on said sides for engagement with said lock lever and for holding said lock lever in place.

4,595,994

OPTICAL ENGAGEMENT ARRAY MULTIPLICATION

Carl M. Verber, and Richard P. Kenan, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation-in-part of Ser. No. 481,184, Apr. 1, 1983, abandoned. This application Jan. 25, 1984, Ser. No. 573,528
Int. Cl.[4] G06G 9/00, 7/16; G02B 6/10
U.S. Cl. 364—841 24 Claims

1. Apparatus for providing a series of optical analog intensities that are proportional respectively to the components of a third array that is the product of a first array of components multiplied by a second array of components in a predetermined order, comprising,

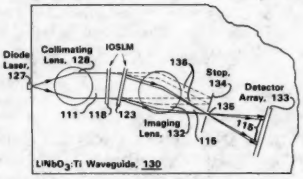
means for directing light of selected intensity to the input side of each of a first set of electrooptic modulating means

each of whose output light intensity is proportional to a know function of an electrical signal applied to it,

means for applying to each of the first set of modulating means, while the light is passing through it, a signal proportional to a function of a selected respective component of the first array such that the intensity of the output light from each of the first set of modulating means is proportional to a known function of its selected respective component;

means for directing the output light from each of the first set of modulating means to the input side of a respective one of a second set of electrooptic modulating means whose output light intensity is proportional to a known function of an electrical signal applied to it,

means for applying to each of the second set of modulating means, while the light is passing through it, a signal proportional to a function of a selected respective component of the second array such that the intensity of the output light from each of the second set modulating means is proportional to a known function of the product of its two selected respective components,



means for directing the output light from each of the second set of modulating means to a respective means responsive thereto for providing an electrical signal that is proportional to a known function of the product of its two selected respective components;

means for applying, after a predetermined time, to each modulating means in each set, while the light is passing through it, a signal proportional to a function of another selected respective component of its respective array such that the intensity of the output light from each of the second set of modulating means is proportional to a known function of the product of its two selected respective components;

and so on, in the same manner, and finally with the last of the selected respective components of the first array and the last of the selected respective components of the second array, to provide an electrical signal that is proportional to a known function of the product of each pair of selected respective components; and

means for directing each individual product signal into a predetermined one of a plurality of data processing means each of which provides an output that is proportional to an appropriate component of the third array.

4,595,995

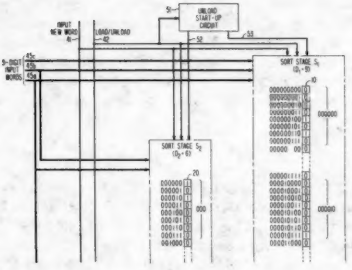
SORT CIRCUIT AND METHOD USING MULTIPLE PARALLEL SORTS OF THE SORTED ITEMS

Harold G. Alles, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 17, 1983, Ser. No. 467,280
Int. Cl.[4] G06F 7/08
U.S. Cl. 364—900 **7 Claims**

6. A method for sorting a plurality of multi-digit words, said method comprising the steps of

setting m selected ones of a plurality of indicators in response to each of at least ones of said multi-digit words, $m \geq 2$, the j^{th} of said m indicators, $j=1,2,\ldots m$, being set as a function of the values of the first through D_j^{th} highest-order digits of said each of said multi-digit words, $D_1 > D_2 > \ldots > D_m$, and



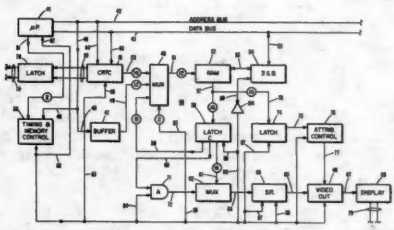
putting out said multi-digit words in a sorted order in response to said set ones of said indicators.

4,595,996

PROGRAMMABLE VIDEO DISPLAY CHARACTER CONTROL CIRCUIT USING MULTI-PURPOSE RAM FOR DISPLAY ATTRIBUTES, CHARACTER GENERATOR, AND REFRESH MEMORY

Kenneth S. Morley, West Valley City; Gregory B. Wiedenman, and James K. White, both of Sandy, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 25, 1983, Ser. No. 488,484
Int. Cl.[4] G06F 3/153, 13/00
U.S. Cl. 364—900 **9 Claims**



1. A video display control circuit for an intelligent terminal of the type having a visual display, comprising:

a general purpose microprocessor having an address bus and a data bus,

an alphanumeric CRT controller for generating row addresses, refresh addresses and CRT timing signals coupled to said microprocessor buses,

means for couping a random access memory (RAM) to said CRT controller and to said microprocessor buses,

said RAM memory providing ASCII character data output in response to a refresh address input,

means for coupling said ASCII character data output from said RAM to the input of said RAM to provide data output signals from said RAM,

means for coupling said alphanumeric CRT controller to said RAM to simultaneously provide row address input information to be combined with said character data output from said RAM to define a unique memory location in said RAM containing video data output information,

means for coupling a buffer register to said RAM for storing said data output information from said RAM in parallel form,

means for coupling a shift register to said buffer register for

serializing said parallel form video data output information in said buffer register,

video output means coupled to said shift register and said visual display for generating signals indicative of dot signals to be displayed on said visual display, and

means for coupling timing and memory control means to said RAM, to the CRT controller, to said microprocessor, and to said RAM for coordinating the transfer of said video data output information being transferred to said buffer register under program control of said microprocessor.

4,595,997

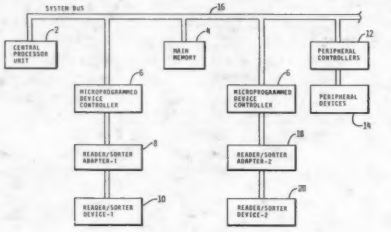
QUEUE SYMBOL FIELD RECOVERY FLAGS FOR DEFINING BOUNDARIES OF ONE OR MORE FIELDS OF A DOCUMENT READ BY A READER SORTER

Arthur A. Parmet, Burlington, and Charles W. Dawson, East Bridgewater, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 98,274, Nov. 28, 1979, abandoned. This application Jan. 9, 1984, Ser. No. 574,631

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—900 **12 Claims**



1. A document processing system for processing information on documents read by a reader sorter includes a central processing unit, a main memory and a controller, all coupled in common to a system bus, said document processing system further including an adapter coupled to said reader sorter and said controller for processing said information, said document processing system comprising:

said adapter including,

receiving means coupled to said reader sorter for receiving character signals representative of said information;

random access memory means coupled to said receiving means and responsive to said character signals for selecting translated character signals, and said translated character signals having a selected one of said said translated character signals in a first state being representative of said character, and a control character, and having said selected one of said translated character signals in a second state being representative of said character being a queue filed identifier character for designating the boundary of a field;

read only memory means coupled to said receiving means and responsive to said character signals for selecting a character identifier having a selected one of said character signals in a first state identifying said character, and having said selected one of said character signals in a second state identifying said control character as a pseudo queue field identifier character for designating the boundary of a field for transfer to main memory; and

multiplexer means coupled to said random access memory and said read only memory means, and responsive to controller signals in a first state for selecting said translated character signals, and responsive to said controller signals in a second state for selecting said character identifier signals for transfer to said controller, wherein said controller is responsive to said translated character signals representative of said queue field identifier character and said character identifier signals representative of said pseudo queue field identifier character;

said controller being further responsive to said translated character signals for generating a start position character count and an end position character count in a field for transfer to said main memory, said controller including,

control means coupled to said adapter for generating said controller signals in said first state for selecting said translated character signals, and said controller signals in said second state for selecting said character identifier signals;

arithmetic logic unit means coupled to said adapter, and responsive to said translated character signals, having said selected one of said translated character signals in said second state, for generating said queue field identifier character, and responsive to said character identification signals, having state, for generating said pseudo queue field identifier character; and

scratch pad memory means coupled to said arithmetic logic unit means including first means for storing first signals representative of said queue field identifier character in a first address location representative of a field opening queue character, second means for storing said first signals in a second address location representative of a field closing character, third means for storing second signals representative of said pseudo queue field identifier character in said first address location, and fourth means for storing said second signals in said second address location of a scratch pad memory.

4,595,998

ELECTRONIC TRANSLATOR WHICH ACCESSES THE MEMORY IN EITHER A FORWARD OR REVERSE SEQUENCE

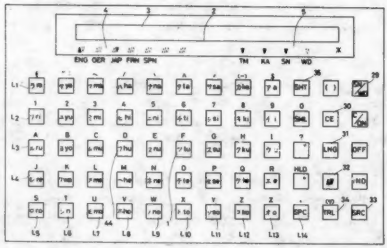
Shintaro Hashimoto, Ikoma; Masafumi Morimoto, Yamatokoriyama; Kunio Yoshida, Nara; Hisao Morinaga, Nara; Tosaku Nakanishi, Nara, and Shigenobu Yanagiuchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 282,935, Jul. 13, 1981, abandoned. This application Nov. 16, 1984, Ser. No. 671,820

Claims priority, application Japan, Jul. 23, 1980, 55-102995

Int. Cl.[4] G06F *15/38*

U.S. Cl. 364—900 **5 Claims**



1. An electronic translator wherein a first word having a predetermined meaning in a first language is entered to obtained a sentence in said first language as well as a translation of said sentence in a second language including a translation word having the same predetermined meaning as said first word, comprising:

input means for entering said first word;

memory means for storing a plurality of words in said first language at locations therein, said words being arranged in source sentences, said memory means further storing translation words in said second language arranged in translation sentence, said translation words being stored in locations related to locations of first words, related sentences being stored in adjacent locations in memory;

access means for successively accessing locations in said memory means and for recalling a source sentence stored therein which includes the first word in said first language and for recalling a translation sentence containing the translation word coresponding in meaning to said first word; and

means for controlling said access means to sequentially access locations in said memory means of said source or translation sentences in either a forward or a reverse direction, as desired so as to access related sentences stored in said memory means.

4,595,999

NON-VOLATILE RANDOM ACCESS MEMORY CELL WITH CMOS TRANSISTORS HAVING A COMMON FLOATING GRID

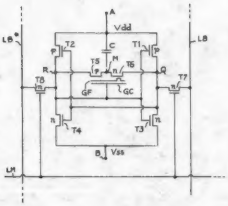
Michel Betirac, Seyssinet, France, assignor to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux, Grenoble, France

Filed Mar. 29, 1984, Ser. No. 594,978

Claims priority, application France, Mar. 31, 1983, 83 05360

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—154 **4 Claims**



1. A non-volatile memory cell, incorporating a bistable flip-flop with two complementary outputs supplied by a d.c. voltage, having a non-volatile storage element, wherein said element is connected between the two complementary outputs of the flip-flop and has a series arrangement of two complementary MOS transistors, namely a n channel transistor and a p channel transistor, said two transistors having a common floating grid covering their channel regions and insulated therefrom by a first thin insulating layer, and a common control grid covering the floating grid and insulated therefrom by a second thin insulating layer, the first insulating layer having a thin injection zone on the side of the source region of one of the complementary transistors said source region being connected to a first output of the flip-flop, whilst the control grid is connected to the second output, said cell also having means for temporarily applying a supply potential to the junction point of the two complementary transistors.

4,596,000

SEMICONDUCTOR MEMORY

Siegfried K. Wiedmann, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1984, Ser. No. 602,866

Claims priority, application European Pat. Off., May 25, 1983, 83105171.9

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—174 **10 Claims**

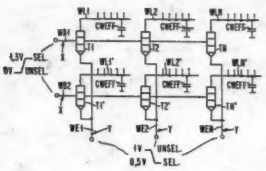
6. Semiconductor memory with cells arranged at the cross point of word and bit lines and which are selected via selection circuits and control lines comprising

a plurality of word switches,

each of said word lines having several partial word lines,

each of said partial word lines being connected to a respective one of said word switches,

a plurality of first word control lines connected to said switches and



a plurality of second word control lines connected to said switches.

4,596,001

BLOCK-DIVIDED SEMICONDUCTOR MEMORY DEVICE

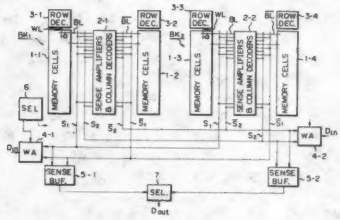
Fumio Baba, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 30, 1983, Ser. No. 556,549

Claims priority, application Japan, Dec. 4, 1982, 57-212085

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—189 **5 Claims**



1. A semiconductor memory device, comprising:

a plurality of word lines;

a plurality of pairs of bit lines;

memory cells, operatively connected to said word and bit lines, each provided at an intersection of said word lines and said bit lines, said memory cells being divided into first and second blocks, separated from each other;

a plurality of pairs of sense lines, each pair comprising first and second adjacent sense lines operatively connected to the first and second blocks of said memory, respectively, each pair of sense lines carrying two complementary signals;

first selecting means, operatively connected to said word lines, for selecting one of said word lines;

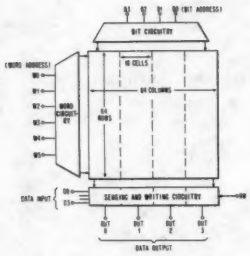
second selecting means, operatively connected to said bit lines and said sense lines, for selecting pairs of bit lines from said bit lines in each block, to connect the selected pairs of bit lines to said pairs of sense lines for a corresponding block; and

third selecting means, operatively connected to said pairs of sense lines, for selecting one of said pairs of sense lines, the first adjacent sense lines for the first block of said memory cells having a sense relationship opposite to the second adjacent sense lines for the second block of said memory cells.

4,596,002
RANDOM ACCESS MEMORY RAM EMPLOYING COMPLEMENTARY TRANSISTOR SWITCH (CTS) MEMORY CELLS

Yuen H. Chan, Wappingers Falls; Frank D. Jones, Wallkill, and William F. Stinson, LaGrangeville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,488
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 14 Claims



1. In a random access memory, said random access memory having enhanced bit line selection speed and enhanced deselection speed, said memory including:

a plurality of memory cells arranged in n rows and m columns, where n and m are respectively positive integers;

n pairs of word lines, each pair of said n pairs of word lines being connected to the memory cells in a discrete one of said n rows of memory cells;

m pairs of bit lines, each pair of bit lines having a first bit line and a second bit line, each pair of said m pairs of bit lines being connected to the memory cells in a discrete one of said m columns of memory cells;

m bit select circuits, each of said m bit select circuits being connected to a discrete one of said m pairs of bit lines;

multi-level address decode circuit means, said multi-level address decode circuit means having output circuit means including a plurality of select lines, each of said select lines being connected to at least a predetermined one of said m bit select circuits;

a bit up-level clamp circuit having an output line; and,

each of said bit select circuits comprising:

first and second transistors, said first and second transistors each having an emitter, base and collector, said collectors of said first and second transistors being connected in common to a potential source,

a first resistor connected between said potential source and a common connection of said bases of said first and second transistors,

a second resistor connected between said emitter of said first transistor and said first bit line of said pair of bit lines connected to said bit selection circuit,

a third resistor connected between said emitter of said second transistor and said second bit line of said pair of bit lines connected to said bit selection circuit,

a first diode connected between a predetermined one of said plurality of select lines and the first bit line of said bit line pair connected to said bit select circuit,

a second diode connected between said predetermined one of said plurality of select lines and the second bit line of said bit line pair connected to said bit select circuit,

a third diode connected between said predetermined one of said plurality of select lines and the common connection of said bases of said first and second transistors of said bit select circuit,

a fourth diode connected between said common connection of said bases of said first and second transistors and said output line of said bit up-level clamp circuit,

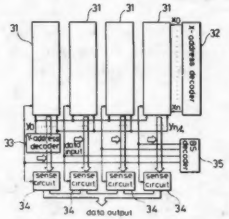
a fifth diode connected between said first bit line of said pair of bit lines connected to said bit selection circuit and a write control circuit, and

a sixth diode connected between said second bit line of said pair of bit lines connected to said bit selection circuit and said write control circuit.

4,596,003
SEMICONDUCTOR MEMORY

Hiroshi Shimizu, Ikeda, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1984, Ser. No. 580,388
Claims priority, application Japan, Feb. 24, 1983, 58-31188
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—189 8 Claims



1. A semiconductor memory comprising:

l pieces of memory cell groups each of which has a matrix of memory cells arrayed in m rows and n_j columns (j=1 . . . l; l is an integer more than or equal to 2);

a plurality of bit lines each of which is connected to all said memory cells in each column in each of said memory cell groups;

a column decoder for selecting a particular bit line from said bit lines in accordance with an input address signal;

(m×l) first word lines each of which is connected to all said memory cells in each row in each of said memory cell groups;

m pieces of second word lines of aluminum provided for each of the m rows in common through all of said memory cell groups;

a row decoder for selecting a particular word line from said m second word lines in accordance with an input address signal;

(m×l) group selecting circuits provided between said paired first and second word lines, whereby said first and second word lines are connected and disconnected;

a group selecting decoder for selecting one from said memory cell groups so as to effect m group selecting circuits for the selected memory cell group including a memory cell corresponding to the input address signal.

4,596,004
HIGH SPEED MEMORY WITH A MULTIPLEXED ADDRESS BUS

Dan R. Kaufman, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 14, 1983, Ser. No. 532,113
Int. Cl.[4] G11C *8/00, 11/40*
U.S. Cl. 365—233 7 Claims

1. A method for efficiently accessing a selected location within a memory organized by rows and columns comprising the steps of:

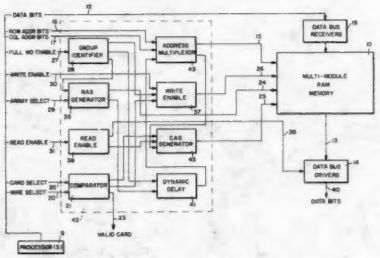
placing a plurality of row address bits on an address bus;

generating a plurality of row address strobe bits for strobing said row address bits into said memory;

activating a dynamic delay element and thereby initiating a delay period after all of said plurality of row address strobe bits have been generated;

switching a multiplexing element from said row address bits to column address bits after said delay period has elapsed;

placing a plurality of column address bits on said address bus after said delay period has elapsed;



detecting that said multiplexing element has switched from said row address bits to said column address bits by analyzing said address bus; and

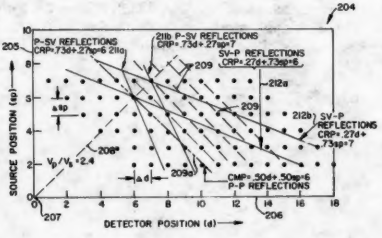
generating a plurality of column address strobe bits for strobing said plurality of column address bits into said memory after said detection step detects that all of the address bits on said address bus have been switched from said plurality of row address bits to said plurality of column address bits.

4,596,005

METHOD OF SEISMIC COLLECTION UTILIZING MULTICOMPONENT PROCESSING RECEIVERS AND PROCESSING RESULTANT CONVENTIONAL AND CONVERTED P- OR S-WAVE DATA

Clint W. Frasier, Irvine, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 20, 1983, Ser. No. 486,660
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—38 **18 Claims**



1. In a method of improving resolution of seismic data collected by conventional common midpoint collection (CMP) methods including sequentially activating a conventional seismic source at a series of sourcepoint locations (SP) along a line of survey and redundantly collecting reflections of both the conventional waves and the converted phases thereof via a series of multicomponent detectors at a plurality of detector stations (D) along said line of survey each detector simultaneously but separately recording the motion of the earth in the radial horizontal direction and in the vertical direction, wherein each resulting convention and converted traces is associated with a sourcepoint-detector station pair of known (SP,D) coordinates, the improvement thereof related to processing both conventional and converted traces in a systematic manner whereby resulting conventional and converted gathers of such traces each samples a reflection point of a target reflector in the subsurface common to each gather irrespective of dip and depth of said target reflector, comprising the steps of

(i) generating seismic field records including at least separate conventional and converted seismic records, by positioning and employing an array of source and multicomponent detectors such that individual sourcepoint-detector station coordinates can be redundantly associated with a selected number of conventional and converted traces of said records, said converted and conventional traces being the simultaneous output of said detectors,

(ii) establishing for said conventional and converted traces a series of separate common reflection points (CRP's), each CRP being for gathering traces common thereto as if a source associated with a given trace of a common gather was placed at said each CRP and activated followed immediately by the relocation of a detector at said each CRP and the reception of conventional or converted waves comprising said conventional or converted trace;

(iii) each CRP associated with said common gather of conventional traces being made to account for different travel paths of the wave due to depth and dip of each target reflector;

(iv) each CRP associated with said common gather of converted traces undergoing dynamic sourcepoint-detector station coordinate transformation to account for nonsymmetrical travel paths of incident and reflected ray, dip as well as depth of said target reflectors, wherein the equation of coordinate transformation is selected from the group comprising:

CRP=kD+(1−k)SP: for conversions of P-waves to Sv-waves at said target;

CRP=(1−k)D+kSP: for conversions of Sv-waves to P-waves at said target;

$$k = \frac{(V_p/V_s)}{[(V_p/V_s) + \{1 + (X/h)\sin\alpha\}(1+f)^{-\frac{1}{2}}]};$$

where

$$f = \frac{[(V_p/V_s) - 1]}{[(V_p/V_s) + 1]} (X/h)^2 \cos^2\alpha;$$

Vp and Vs are the P-wave and Sv-wave velocities, respectively, of the overburden;

X is the source-receiver offset distance;

h is the depth of the target reflector;

α is the dip angle of the target reflector; and

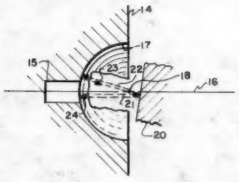
SP and D are source and detector coordinates, respectively, along the line of survey.

4,596,006

ULTRASONIC OBJECT DETECTOR

Kenneth C. Eder, Blaine, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 16, 1984, Ser. No. 590,315
Int. Cl.[4] H04B *11/00*
U.S. Cl. 367—87 **20 Claims**



18. A method for detecting the presence of a target with an ultrasonic sensor having a single electroacoustic transducer

where the target is closer to the transducer than a minimum direct detection range limit arising from unavoidable ringing of the transducer for a time interval following transmission of a burst of acoustic energy, the method comprising the steps of:

transmitting a burst of acoustic energy from the transducer toward the target;

repeatedly reflecting at least a portion of the acoustic energy reflected from the target back toward the target; and

detecting acoustic energy reflected from the target by means of the transducer after the ringing interval has passed.

19. The method of claim **18** wherein the step of repeatedly reflecting at least a portion of the acoustic energy is performed by a reflecting surface surrounding the electroacoustic transducer.

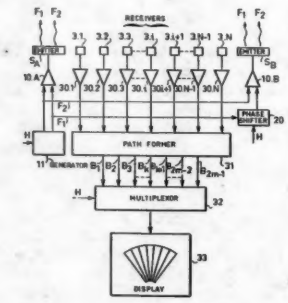
20. The method of claim **19** wherein the reflecting surface is configured as a spherical section having its center of curvature centered in the transducer beam pattern at a distance from transducer equal to approximately two-thirds the minimum direct direction range limit.

4,596,007

INTERFEROMETRIC SONAR IN NON-LINEAR ACOUSTICS

Georges Grall, Le Conquet, and Francois Peynaud, Brest, both of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 12, 1983, Ser. No. 541,313
Claims priority, application France, Oct. 12, 1982, 82 17071
Int. Cl.[4] G01S *15/87*
U.S. Cl. 367—92 **7 Claims**



1. An interferometric sonar in non-linear acoustics comprising:

a sending transducer array including two transducers spaced at a distance L;

means for supplying said two transducers with a first high frequency F_1 in phase and with a second high frequency F_2 alternately in phase and in phase opposition in which case said transducer array has an interferometric pattern which exhibits a set of peak values;

a receiving transducer array having an array of transducers uniformly spaced between the sending transducers; and

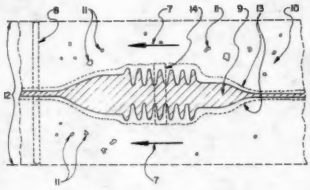
means for detecting the signals at a difference low-frequency $F_1 - F_2$ which are received by the receiving transducer array, and for forming low-frequency channels centered on said peak values of the interferometric pattern.

4,596,008

OPTICAL SOUND TRACK PLAYBACK APPARATUS AND METHOD

Terry D. Beard, 1407 Northview Dr., Westlake Village, Calif. 91361

Filed Aug. 25, 1983, Ser. No. 526,433
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—107 **17 Claims**



1. A method of reading a variable width optical sound track which is displayed on a film, comprising the steps of:

determining the locally averaged width of the sound track along the length of the film,

scanning a portion of the film which includes the sound track,

controlling the scanning in response to the locally averaged sound track width so that the width of the film which is scanned at any location along the film varies in positive proportion to the locally averaged sound track width at that location and substantially excludes the film outside the locally averaged width from the scanning,

detecting light transmitted through the film by said scanning, and

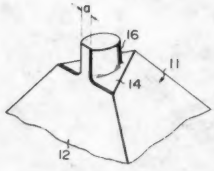
generating a sound signal which varies in accordance with the amount of detected light.

4,596,009

INFORMATION SIGNAL REGENERATING STYLUS AND MANUFACTURING METHOD THEREOF

Tetsuo Yoshikane, Katano; Akira Kagata, Neyagawa, and Hiromi Hiura, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 628,976, Jul. 10, 1984, Pat. No. 4,534,136, which is a continuation of Ser. No. 333,897, Dec. 23, 1981, abandoned. This application Jun. 5, 1985, Ser. No. 741,364
Claims priority, application Japan, Dec. 29, 1980, 55-188664; Oct. 27, 1981, 56-172311
Int. Cl.[4] G11B *3/00*
U.S. Cl. 369—173 **1 Claim**



1. An information signal regenerating stylus having a conical stylus base of non-conductive material and a tip projecting from said base, said tip comprising a face at the distal end of the tip adapted for contacting a recording disc and a surrounding lateral surface, a portion of said lateral surface being in common with a portion of the lateral surface of said base, said common surface portion having an electrode formed thereon, said electrode being defined by two parallel portions of the lateral surface of said tip in order to form a substantially constant width of said electrode in the region of the tip, all of the lateral surface portions of the tip being parallel to said elec-

trode so that the tip is generally in the form of a cylinder, with the maximum width of the tip being greater than the width of the electrode portion of the tip.

4,596,010

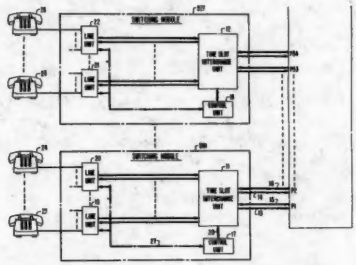
DISTRIBUTED PACKET SWITCHING ARRANGEMENT

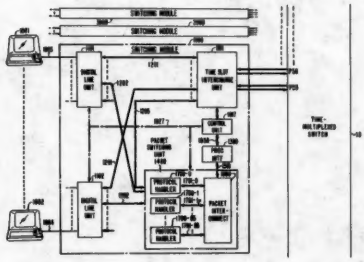
Mark W. Beckner, Morristown, N.J.; James A. Davis, Glen Ellyn, Ill.; Eric J. Gausmann, Long Valley, N.J.; Thomas L. Hiller, Berkley, Ill.; Philip D. Olson, Rohnert Park, Calif., and Gilbert A. Van Dine, West Chicago, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

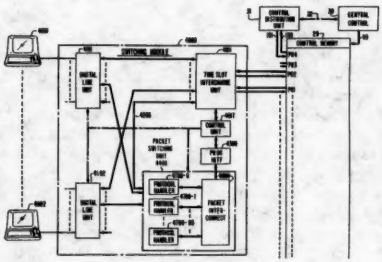
Filed May 3, 1984, Ser. No. 606,751

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **22 Claims**







1. A switching system comprising

a plurality of switching modules each associated with a corresponding plurality of user terminals and

inter-module connection means,

each said switching module comprising circuit switching means for providing circuit-switched communication channels among its associated user terminals and between its associated user terminals and said intermodule connection means, and packet switching means connectible to said inter-module connection means for providing packet-switched communication channels among its associated user terminals and between its associated user terminals and said inter-module connection means,

said inter-module connection means comprising means for interconnecting the circuit switching means of each of said switching modules for inter-module circuit-switched communication, and means for interconnecting the packet switching means of each of said switching modules for inter-module packet-switched communication.

4,596,011

DATA TRANSMISSION SYSTEM FOR A LOCAL NETWORK

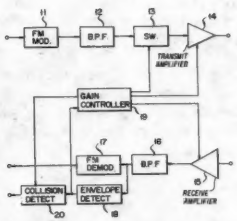
Hiroshi Kobayashi; Tsuguhiro Hirose, both of Tokyo, and Hideaki Haruyama, Fujisawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 19, 1983, Ser. No. 563,248

Claims priority, application Japan, Dec. 22, 1982, 57-225215

Int. Cl.[4] H04J *3/02, 6/00*

U.S. Cl. 370—85 **11 Claims**



1. A data transmission system comprising:

a communication medium;

a plurality of data processors each arranged to transmit and receive an information signal in a digital form having mark and space periods; and

a plurality of modems for coupling said data processors to said communication medium to effect transmission and reception of information signals among said data processors via said communication medium;

each of said modems including:

modulating means connected to receive an information digital signal from a corresponding data processor for shifting a carrier signal frequency to a first and second frequency according to the mark and space of the information digital signal, the modulated carrier signal being transmitted over said communication medium; and

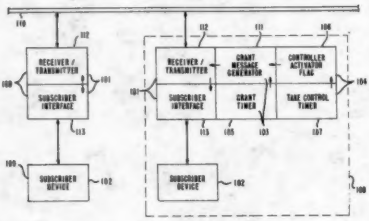
collision detecting means coupled to said communication medium for detecting a signal collision on the basis of a beat signal resulting from the difference between the first and second frequencies of modulated carrier signals simultaneously transmitted from modems to said communication medium to inhibit the corresponding data processor from issuing an information digital signal;

the first and second frequencies being set such that one cycle period of the beat signal is shorter than or equal to a minimum time length of the mark and space periods of the information signal.

4,596,012
MASTER CONTROLLER SUCCESSION SYSTEM FOR BUS CONTROL ACCESS FOR DATA-COMMUNICATIONS LOCAL AREA NETWORKS

Lockwood W. Reed, Holland Rd., Middletown, N.J. 07748

Filed May 25, 1983, Ser. No. 497,957
Int. Cl.[4] H04J 3/02
U.S. Cl. 370—85 9 Claims



1. A method for maintaining control of the exchange of information between stations of an information exchange system comprising:

attaching stations or subscribers to a common information channel over which information is exchanged between said stations or subscribers;

connecting a plurality of slave stations attached to said connecting channel, each of said slave stations including means to transmit and receive information over said connecting channel;

connecting a plurality of master stations attached to said connecting channel, each of said master stations:

transmitting and receiving information on said connecting channel;

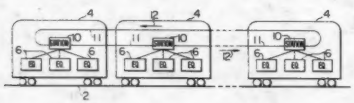
providing control means to actualize the exchange of information between all stations attached to said connecting channel, including means to become disabled on initial application of power or detection of circuitry malfunction; and

providing control activation means to make active a master station by enabling said control means according to a prescribed schedule including an active control detection means to determine a condition when no said master station is in active control of the information exchange over said connecting channel.

4,596,013
DATA TRANSMISSION NETWORK

Korefumi Tashiro, Hitachi; Kunio Saito, Katsuta; Hiroshi Takenaga, Hitachi, and Masahiro Yasunami, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,557
Claims priority, application Japan, Jan. 26, 1982, 57-9463
Int. Cl.[4] H04J 3/00, 3/02; H04Q 3/00
U.S. Cl. 370—86 7 Claims

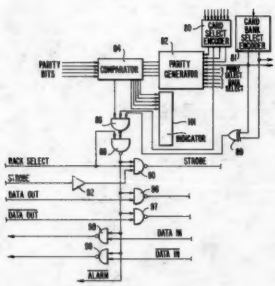


1. A data transmission network in which a plurality of data transmission stations are connected by a loop-like transmission line for mutual data transmission; said network comprising means for generating sequentially a plurality of data frames having the same length so that said plurality of data frames continuously circulate on said transmission line simultaneously, with the circulation time for each data frame being constant, each data frame having plural data packets fixedly allocated to respective ones of said data transmission stations; means provided in each of said data transmission stations for receiving and storing the data frame from said transmission line, for modifying the received data frame only by replacing the contents of the data packet thereof allocated to its own station and for sending out the modified data frame to said transmission line, so that each data packet has written therein only data from the station to which that packet is allocated; and means for selectively reading out and processing the data to be used for its own station out of any data packet of said stored data frame after sending out said modified data frame.

4,596,014
I/O RACK ADDRESSING ERROR DETECTION FOR PROCESS CONTROL

James E. Holeman, Plano, Tex., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 21, 1984, Ser. No. 581,629
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—49 9 Claims

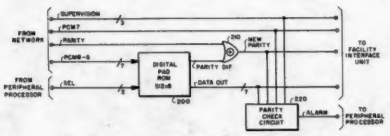


1. A system for detection and prevention of addressing errors comprising a plurality of output data points each settable in accordance with an applied data signal, a computer system, an a multiline connector connected to transmit signals between said computer system and said output data points, said computer system comprising addressing means to generate a multibit address signal and a data signal and to transmit said address signal and said data signal through said connector, data point setting means responsive to an address signal transmitted through said connector from said computer system to select one of said output data points corresponding to the address signal transmitted through said connector and set the selected output data point in accordance with the data signal generated with said address signal and transmitted through said connector, means responsive to the address signal generated by said addressing means before it is applied to said connector to generate a first parity signal, means responsive to the address signal transmitted from said computer system through said connector to generate a second parity signal from the address signal transmitted through said connector, and comparator means to compare said first parity signal with said second parity signal and if said first parity signal does not correspond with said second parity signal to prevent said data point setting means from setting the selected data point in accordance with the data signal generated with said address signal.

4,596,015
FAILURE DETECTION APPARATUS FOR USE WITH DIGITAL PADS

John L. Clements, and Stig E. Magnusson, both of Phoenix, Ariz., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Continuation of Ser. No. 467,718, Feb. 18, 1983, abandoned. This application Jul. 1, 1985, Ser. No. 750,660
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—51 3 Claims



1. In a digital switching system including a digital switching network for transmitting PCM data samples through said switching network between subscriber interface equipments via digital pads, failure detection apparatus for use with said digital pads comprising:

said digital switching network connected between said subscriber interface equipments via said digital pads said digital switching network being operated to transmit pluralities of said PCM samples between subscribers connected to said subscriber interface equipments;

each of said PCM data samples including a first plurality of data bits representing a magnitude value of said data samples, a second plurality of data bits and a first data parity bit representing parity over said first and second pluralities of data bits;

means for storing connected between said network and said subscriber interface equipment, said means for storing being operated in response to said first plurality of bits of each said PCM data sample to produce a corresponding modulated magnitude value of each said PCM data sample for transmission to said subscriber interface equipment;

said means for storing including parity generator means connected to said network and to said subscriber interface equipment, said parity generator means being operated to transmit a selected one of a stored plurality of second data parity bits representing the difference of parity between said magnitude value of each said PCM sample and said corresponding modulated magnitude value;

gating means connected to said network and to said parity generator means, said gating means being operated in response to said first and second data parity bits to produce a third data parity bit over said PCM data sample including said modulated magnitude value and said second plurality of bits;

parity checking means connected to said network, to said subscriber interface equipment, to said means for storing, and to said gating means, said parity checking being operated to calculate correct data parity over each said PCM data sample including said modulated magnitude value and said second plurality of bits, said parity checking means being further operated to compare said calculated correct data parity with said third data parity bit and to produce a first signal for a miscomparison of said bits indicating a failure of said digital pads;

processor means connected to said digital switching network, to said parity generator means and to said parity checking means, said processor means being operated to receive said first signal indicating said miscomparison and to reconfigure said digital switching network in response to a predetermined number of said miscomparisons;

said means for storing further including programmable read only memory means connected to said network, said programmable read only memory means containing a plurality of modulated magnitude values corresponding to each said PCM data sample transmitted by said digital switching network;

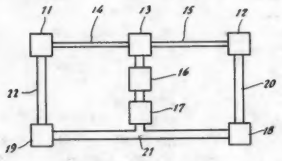
said processor means further including a plurality of connections to said programmable read only memory means; and

said programmable read only memory means being operated in response to said processor means to select one of said plurality of modulated magnitude values for each said corresponding PCM data sample.

4,596,016
SINGLE MODE CARBON DIOXIDE GAS LASER OSCILLATOR HAVING HIGH OUTPUT POWER

Yasuyuki Morita, Yokohama, and Reiji Sano, Kawasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 14, 1983, Ser. No. 513,794
Claims priority, application Japan, Jul. 14, 1982, 57-122554
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—58 6 Claims



1. A carbon dixode laser oscillator for generating a single mode laser beam, comprising:

a discharge tube having a predetermined inner diameter;

a total reflective mirror arranged at one end of said discharge tube;

a partially reflective mirror arranged at a second end of said discharge tube;

a pair of electrodes arranged one at each end of said discharge tube and supplied with a potential for causing an electrical discharge in the discharge tube to produce said laser beam;

means for supplying to said discharge tube a laser gas having a predetermined viscosity; and

means for controlling density and velocity of said laser gas in said discharge tube at predetermined values respectively so that a Reynolds number given by said inner diameter of the tube and said density, viscosity and velocity of the gas is in the range between 1.9×10 and 1×10^4.

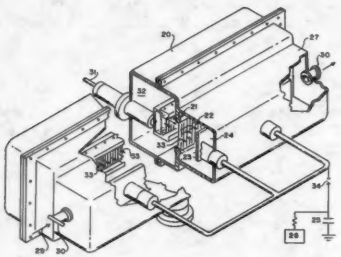
4,596,017
ELECTRON BEAM METHOD AND APPARATUS FOR OBTAINING UNIFORM DISCHARGES IN ELECTRICALLY PUMPED GAS LASERS

Charles A. Fenstermacher, and Keith Boyer, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 162,074, Jul. 13, 1971, abandoned. This application Apr. 20, 1983, Ser. No. 485,132
Int. Cl.[4] H01S *3/09*
U.S. Cl. 372—74 19 Claims

1. A method for producing a population inversion in a laser gas medium suitable for supporting laser oscillation and amplification therein by initiating and sustaining a large-volume, high-energy, uniform electrical discharge therein at atmospheric pressure and above, which comprises the steps of: pressurizing the laser gas medium to pressures greater than or equal to one atmosphere and defining thereby a volume of the laser gas medium; impressing an electrical voltage across the volume of the laser gas medium, the voltage being less than the breakdown voltage of the medium yet sufficient to produce a

substantially uniform high-energy discharge in the medium when the medium is ionized without generating substantial additional ionization in the laser gas medium; and passing a high-energy electron beam through substantially the entire



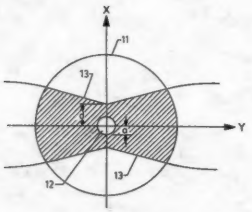
volume of the laser gas medium for a sufficient time period to produce ionization of the medium, whereby a population inversion suitable for laser oscillation and amplification is generated thereby.

4,596,018

EXTERNAL ELECTRODE TRANSVERSE HIGH FREQUENCY GAS DISCHARGE LASER

Carl L. Gruber, St. Michael, and Gerald R. Willenbring, St. Paul, both of Minn., assignors to Minnesota Laser Corp., St. Paul, Minn.

Filed Oct. 7, 1983, Ser. No. 539,993
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 **37 Claims**



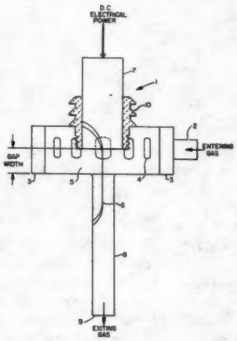
1. A gas laser comprising:
(a) an electrically insulative body defining a discharge chamber for containing a laser gas;
(b) a laser gas disposed in the chamber;
(c) first and second electrodes means for exciting said laser gas;
(d) means for applying a voltage of alternating polarity between the first and second electrodes to establish a laser-exciting discharge in the laser gas;
(e) means for attaching a first laser mirror to one end of the body and a second laser mirror to the other end of the body, both mirrors being in axial alignment with the chamber with a portion of said chamber between said mirrors defining a resonant cavity with one of said mirrors being partially reflective;
(f) said means for attaching said laser mirrors comprising a first metallized ring formed around one end of said body and a second mtallized ring formed around the other end of said body, a first mirror mount for mounting said first mirror therein and a second mirror mount for mounting said second mirror therein with said first mount brazed to said first metallized ring and said second assembly brazed to said second metallized ring.

4,596,019

METHOD AND APPARATUS FOR THE GENERATION OF HOT GASES WITH AN ELECTRIC ARC

Herbert Schmidt, and Richard Müller, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 27, 1983, Ser. No. 536,432
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236037
Int. Cl.[4] H05B *7/00*
U.S. Cl. 373—22 **8 Claims**



1. A method for the generation of hot gases which are under increased pressure with the use of a direct-current-operated, gas-vortex stabilized high-voltage arc furnace having hollow electrodes and a vortex chamber, which comprises feeding a gas to be heated into the vortex chamber of the furnace tangentially into an arc generated across the vortex chamber; with the momentum flow of the gas to be heated being at least 10 kg m/s^2, the velocity of the gas being at least 10 m/s upon entrance of the gas into the vortex chamber, and the pressures in the vortex chamber being 1.5 to 10 bar (absolute); utilizing hollow electrodes having a ratio of the internal diameter of the cathode to that of the anode of 1.6 to 2.5; providing a spacing between the adjacent ends of the electrodes amounting to 0.9 to 0.7 times the internal diameter of the cathode and discharging heated gas through at least one of the hollow electrodes.

4,596,020

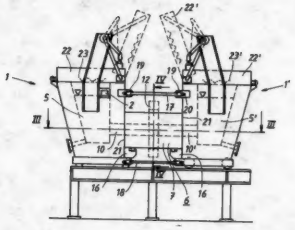
METAL MELTING AND MELT HEAT RETAINING FURNACE

Lars Halen, Västerås, Sweden, assignor to Asea AB, Västerås, Sweden

Filed Oct. 12, 1983, Ser. No. 541,354
Claims priority, application Sweden, Oct. 18, 1982, 8205898; Jun. 15, 1983, 8303419
Int. Cl.[4] H05B *6/34*
U.S. Cl. 373—161 **2 Claims**

1. A metal melting furnace comprising two horizontally interspaced furnace vessels each forming a melt-containing chamber and each having a side wall facing the side wall of the other furnace and an opening in its side wall opening from its chamber and horizontally aligned with the opening of the side wall of the other furnace, and an inductor positioned between said side walls and comprising a single integral block of ceramic forming opposite ends abutting the outside of the side walls and a transverse through-hole and two horizontal through-holes straddling the transverse through-hole and having ends open to said chambers so the latter intercommunicate, and an inductor core provided with an energizing coil having a leg extending through said transverse through-hole, the opposite ends of the inductor's said block separably abutting the outsides of said side walls, one of said furnace vessels being

horizontally movable towards and from the other furnace vessel so that the inductor is removable, and the furnace vessels having means releasably forcing and holding the furnace vessels together with the inductor between the side walls, at



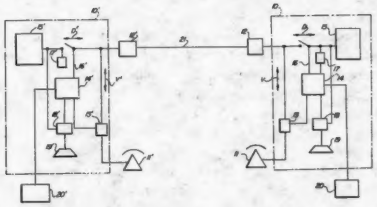
least one of said furnace vessels having a cover provided on its bottom with a heating means retaining the heat of a melt in that furnace vessel for a period of time when said inductor is unpowered.

4,596,021

MODEM FOR SWITCHING BETWEEN VOICE AND DATA COMMUNICATIONS ON A SINGLE TELEPHONE CALL

Kelly Carter, Denver, Colo.; Steve Gallagher, Mountain View, Calif.; Gregory Iverson, Boulder, Colo., and Kenneth R. Krechmer, Palo Alto, Calif., assignors to Prentice Corporation, Sunnyvale, Calif.

Filed Apr. 12, 1984, Ser. No. 599,568
Int. Cl.[4] H04J *3/17*; H04M *11/06*
U.S. Cl. 375—5 **11 Claims**



1. An apparatus for switching between transmission of data communications and transmission of voice communications over a communications channel having a local end and a remote end, comprising:

local voice terminal means for transmitting and receiving via the communications channel voice communications at the local end of the communications channel when said local voice terminal means is actuated,

local modem means for modulating with digital information and transmitting a local carrier signal over the communications channel;

remote modem means for receiving over the communications channel and demodulating the local carrier signal;

remote carrier detect means for detecting whether a local carrier signal is being received by said remote modem means, said remote carrier detect means generating a remote carrier detect signal that is in a first state when the local carrier signal is being received by said remote modem means and in a second state when the local carrier signal is not being received by said remote modem means;

remote indicator means responsive to the remote carrier detect signal for generating a remote indicator signal when the remote carrier detect signal is in the second state; and

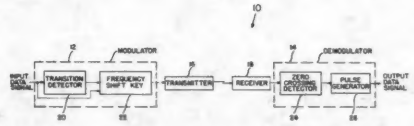
local logic means for stopping transmission of the local carrier signal by said local modem means when said local voice terminal means is actuated, whereby when said local voice terminal means is actuated, said local logic means causes said local modem means to cease transmitting the local carrier signal, which is detected by said remote carrier detect means, in response to which the remote carrier detect signal changes from the first state to the second state causing said remote indicator means to generate the remote indicator signal.

4,596,022

FSK DATA COMMUNICATION SYSTEM

Donald L. Stoner, King County, Wash., assignor to The Microperipheral Corporation, Redmond, Wash.

Filed Aug. 25, 1983, Ser. No. 526,335
Int. Cl.[4] H04L *27/10*
U.S. Cl. 375—45 **8 Claims**



1. A system for communicating digital data over a transmission link comprising:

transition detector means for detecting high-to-low transitions in the binary logic state of an input digital signal and generating a first transition indicator signal in response thereto, and for detecting low-to-high transitions in the binary logic state of said input digital signal and generating a second transition indicator signal in response thereto;

oscillator means for selective generation of an output signal comprising a high-frequency signal at a frequency substantially equal to the baud rate of said input digital signal and a low-frequency signal at a frequency substantially equal to one-half the baud rate of said input digital signal;

reset means for resetting said oscillator means to reset said oscillator output signal to a null position in response to each of said first and second transition indicator signals and allowing substantially in-phase switching of said oscillator output signal between said high-frequency and low-frequency signals;

switching means for switching said oscillator means between said high-frequency and low-frequency signals in response to said input digital signal, said switching means switching said oscillator means to said high-frequency signal when said input digital signal is at one logic state for producing substantially one cycle of said high-frequency signal corresponding to a bit of said input digital signal at the one logic state, and switching said oscillator means to said low-frequency signal when said input digital signal is at an other logic state for producing substantially one-half cycle of said low-frequency signal corresponding to a bit of said input digital signal at the other logic state to generate a frequency-shift keyed signal to be transmitted over the link;

zero-crossing detector means for detecting zero-crossings of said frequency-shift keyed signal received over the link and generating a zero-crossing indicator signal;

frequency detector means responsive to said zero-crossing signal for detecting said high-frequency and low-frequency signals of said frequency-shift keyed signal, and generating a frequency indicator signal; and

pulse generator means responsive to said zero-crossing indicator signal and said frequency indicator signal for gener-

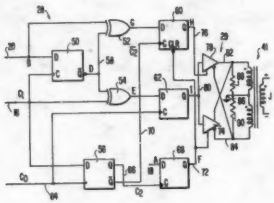
ating an output digital signal corresponding to said input digital signal.

4,596,023

BALANCED BIPHASE TRANSMITTER USING REDUCED AMPLITUDE OF LONGER PULSES

R. Byron Driver, and Larry Fullerton, both of Huntsville, Ala., assignors to Complexx Systems, Inc., Huntsville, Ala.

Filed Aug. 25, 1983, Ser. No. 526,467
Int. Cl.[4] H03M *5/12*; H04B *1/62*; H04L *27/18*
U.S. Cl. 375—55 **14 Claims**



13. A method of transitting data across a communication link, comprising:

receiving nonreturn-to-zero data signals and converting said nonreturn-to-zero data signals to biphase signal pulses;

sensing transitions in said nonreturn-to-zero data signals by inverting and delaying said nonreturn-to-zero data signals, exclusively ORing said nonreturn-to-zero data signals and said inverted and delayed nonreturn-to-zero data signals to provide a signal indicating said transitions; and

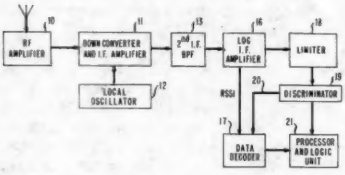
controlling the amplitude of said biphase signals in response to said signal indicating said transitions by producing biphase signal pulses at a low amplitude corresponding to a half bit period preceding a transition of said nonreturn-to-zero data and a half bit period following said transition and producing other biphase signal pulses at a high amplitude.

4,596,024

DATA DETECTOR USING PROBABALISTIC INFORMATION IN RECEIVED SIGNALS

David J. Thomson, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 23, 1983, Ser. No. 497,228
Int. Cl.[4] H04B *7/10*
U.S. Cl. 375—100 **14 Claims**



1. In a data decoder for regenerating baseband data which represents signal information by different signal bit combinations, each bit being represented by either a first or a second signal state,

means for weighting plural versions of digitally represented signal information individually according to at least one predetermined information utility criterion to produce multiple weighted versions thereof,

means for averaging said multiple, weighted versions of said information from said weighting means, and

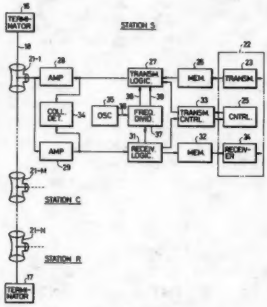
means for determining from an average produced by said averaging means the information-representative signal state.

4,596,025

TIMING SYNCHRONIZATION CIRCUIT

Takane Satoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1983, Ser. No. 518,566
Claims priority, application Japan, Jul. 29, 1982, 57-131148
Int. Cl.[4] H04L *7/00*
U.S. Cl. 375—107 **8 Claims**



1. A timing synchronizing circuit, for every station in a communication system comprising a plurality of stations and one master station, said master station being a reference station for system synchronization in an asynchronous transmission system, comprising:

an oscillator in every station for producing a clock signal of a frequency substantially equal to those of other stations;

a frequency divider in every station for frequency-dividing said clock signal, said frequency divider for each station defining frames and blocks within said frames, to format signal transmission between said stations;

detecting means for detecting signals of block units transmitted from the master station;

reset signal producing means for producing a reset signal, which defines a block start point of a block, from said signal being detected; and

timing setting means for initializing said frequency divider with the said of said reset signal.

4,596,026

ASYNCHRONOUS DATA CLOCK GENERATOR

Richard G. Cease, Concord; Caesar J. Favaloro, Sudbury, and James G. Hackendorf, Wayland, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 492,544, May 9, 1983, abandoned, which is a continuation of Ser. No. 211,498, Dec. 1, 1980, abandoned. This application Mar. 7, 1985, Ser. No. 708,377
Int. Cl.[4] H04L *25/36*
U.S. Cl. 375—118 **13 Claims**

1. In combination:

a serial to parallel converter for converting incoming asynchronous serial digital data to data words;

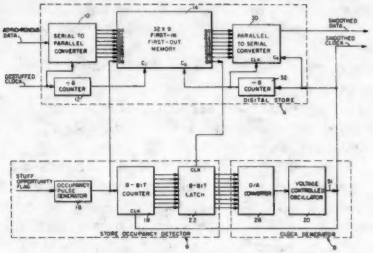
an elastic store connected to the output of said converter for storing a plurality of said data words;

means for sequentially clocking said data words into said elastic store;

means for clocking said data words out of said elastic store;

means for providing a signal corresponding to the occupancy of said elastic store, said providing means comprising means for measuring the time interval between one of said data words being clocked into said elastic store and said one being clocked out of said store; and

said clocking out means comprising means responsive to said signal for generating a substantially smooth clocking out



clock having a long term rate substantially equal to the rate of said clocking into means.

4,596,027

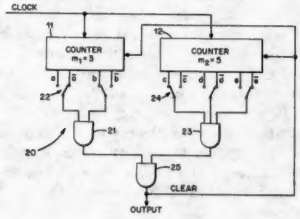
COUNTER/DIVIDER APPARATUS

Peter Bernardson, Tempe, Ariz., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 411,160, Aug. 25, 1982, abandoned. This application Jun. 24, 1985, Ser. No. 747,675

Int. Cl.[4] H03K *23/00, 23/66*

U.S. Cl. 377—33 **7 Claims**



1. Counting apparatus comprising

a plurality of counting means, each being operable to count repeatedly through a sequence of a different number of clock pulses and to produce an output signal representing the count accumulated therein during each sequence, said different number for each counting means being a relatively prime number with respect to said different number for each of the other counting means of the plurality;

a source of clock pulses connected to each of said counting means in parallel for applying clock pulses to each of the counting means of the plurality; each of the counting means counting each clock pulse; and

detecting means coupled to each of the counting means of the plurality and having an output terminal, said detecting means being operable to produce an output signal at the output terminal in response to a combination of predetermined output signals from the plurality of counting means;

each of said counting means of the plurality having a clear connection coupled to the output terminal of said detecting means and being operable in response to an output signal thereon to clear the counting means of the count accumulated therein.

4,596,028

GENERAL PURPOSE X-RAY TUBE FOR STEREOGRAPHY

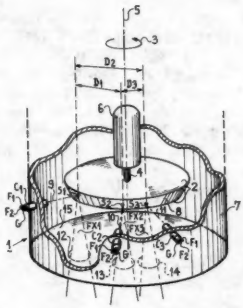
Emile Gabbay, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 5, 1983, Ser. No. 520,710

Claims priority, application France, Aug. 6, 1982, 82 13801

Int. Cl.[4] A61B *6/02;* **H01J** *35/00, 35/06*

U.S. Cl. 378—41 **6 Claims**



1. A general purpose X-ray tube for stereography, comprising:

a rotary anode;

n independent cathodes, of the same type and whose focal points are the same size, and with n being at least equal to three, disposed so as to allow the formation on an anode target of n sources of an X-ray beam spaced apart from each other by a different distance, any two of said sources being associated to as to form a working pair chosen as a function of the distance apart of the sources which form it, these latter being formed alternately so that the X-ray beam which they generate allows stereographic pictures to be taken of a subject compatible with a chosen enlargement value.

4,596,029

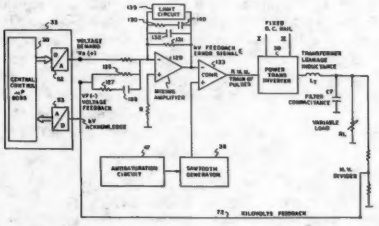
X-RAY GENERATOR WITH PHASE-ADVANCE VOLTAGE FEEDBACK

Carlos Manueco Santurtûn, and Angel Diaz Carmena, both of Madrid, Spain, assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 22, 1983, Ser. No. 564,621

Int. Cl.[4] H05G *1/32*

U.S. Cl. 378—105 **9 Claims**



1. In an X-ray generator system of the type having an inverter which delivers a d.c. output to an X-ray tube by way of a transformer and a rectifier, a control system comprising:

(a) means for generating a voltage demand signal for use in determining the d.c. output;

(b) means for sensing the output voltage and generating a voltage feedback signal representative thereof;

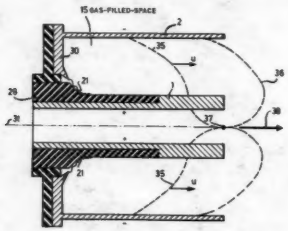
(c) means for applying a phase-advance effect to said voltage feedback signal to provide a variable gain signal;
(d) means for comparing said variable gain signal with said voltage demand signal to obtain a voltage error signal; and
(e) means for controlling the inverter in response to said voltage error signal, such that the output voltage waveform is of a generally square-wave shape with a relatively fast rise time and with no significant overshoot.

4,596,030

APPARATUS FOR GENERATING A SOURCE OF PLASMA WITH HIGH RADIATION INTENSITY IN THE X-RAY REGION

Gerd Herziger, Rossdorf, and Willi Neff, Michelstadt, both of Fed. Rep. of Germany, assignors to Carl Zeiss Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,298
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332711
Int. Cl.[4] H01J *35/00*; G21B *1/00*; G21K *5/00, 7/00*
U.S. Cl. 378—119 **18 Claims**



1. A device for producing a plasma source of highintensity radiation in the X-ray region, comprising a cylindrical inner electrode which at one end is surrounded annularly by an insulator and which, together with an outer electrode which surrounds it concentrically at a distance away D, forms a discharge space filled with gas of low pressure which is open toward the other end of the inner electrode, and a switch for momentarily connecting the ends of the electrodes located on the closed side of the discharge space with an electrical energy storage, characterized by the combination of the following features:
(a) on the closed end of the discharge space, a field emission electrode (4) which is at the potential of the outer electrode (2) surrounds the insulator (3) concentrically at a distance d between the electrode point and the insulator surface, which distance d is smaller than the mean free path of the electrons in the gas of the discharge space;
(b) the material and the nature of the surface of the insulator (3) are so selected that said surface has a high coefficient η of secondary-electron emission ($\eta \approx 3$); and
(c) a high-power switch of low inductance is connected to the energy storage (16) and serves to switch high power flows (about 10^8 W/cm^2) with high rise rates (about 10^{17} W/cm^2.s) is directly connected to the electrodes (1, 2) of the discharge space, on the closed ends thereof.

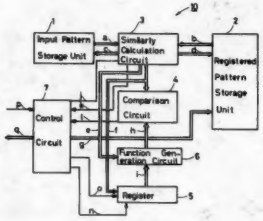
4,596,031

METHOD OF SPEECH RECOGNITION

Mitsuhiro Hakaridani, Nara; Yoshiki Nishioka, Tenri, and Hiroyuki Iwahashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1982, Ser. No. 451,937
Claims priority, application Japan, Dec. 28, 1981, 56-214175
Int. Cl.[4] G10L *1/00*
U.S. Cl. 381—43 **2 Claims**

1. In a speech recognition system for successively judging the similarities between test patterns of speech and a plurality of stored feature patterns of speech, and identifying which of said stored feature patterns is most similar to said test pattern, said test patterns and feature patterns being divisible into corresponding frames of information, the improvement comprising:
(a) input means for introducing a test pattern into said system;
(b) memory means for storing said plurality of feature patterns;
(c) judging means for sequentially accessing said stored feature patterns in said memory means and calculating similarity values between said corresponding frames of said test patterns and each of the feature patterns;
(d) function generator means for developing a threshold similarity pattern having threshold similarity values for each of the said corresponding frames, said threshold similarity values having predetermined initial values;



(e) comparator means for comparing the similarity values calculated by said judging means with the threshold similarity values of the threshold similarity pattern, and generating a stop signal when any similarity value of a given corresponding frame is less than a threshold similarity value for that frame;
(f) control means responsive to said stop signal for precluding said judging means from calculating any further similarity values for the frames of the feature pattern then being judged and causing said judging means to access and calculate similarity values for another stored feature pattern in said memory means; and
(g) identification means for identifying which of said feature patterns, the calculated similarity values of which as compared to the test pattern have no frames with similarity values less than said threshold values, is the most similar to said test pattern.

4,596,032

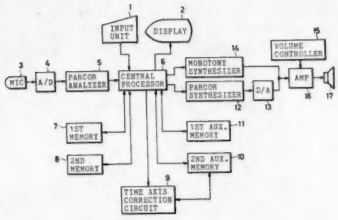
ELECTRONIC EQUIPMENT WITH TIME-BASED CORRECTION MEANS THAT MAINTAINS THE FREQUENCY OF THE CORRECTED SIGNAL SUBSTANTIALLY UNCHANGED

Atsushi Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,966
Claims priority, application Japan, Dec. 14, 1981, 56-201127
Int. Cl.[4] G10L *1/00*
U.S. Cl. 381—51 **13 Claims**

1. Electronic equipment comprising:
memory means for storing melody information;
input means for inputting vocal information corresponding to the melody information stored in said memory means;
correction means for correcting intervals and times of the vocal information inputted by said input means, while maintaining the frequency of the vocal information sub-

stantially unchanged, by referring to the melody information; and



output means for outputting the vocal information corrected by said correction means.

4,596,033

ATTENUATION OF SOUND WAVES

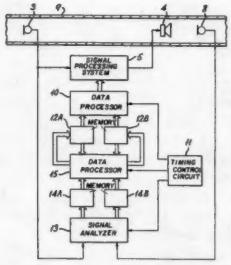
Malcolm A. Swinbanks, Pentlands Close, England, assignor to National Research Development Corp., London, England

Filed Feb. 21, 1985, Ser. No. 704,028

Claims priority, application United Kingdom, Feb. 21, 1984, 8404494

Int. Cl.[4] G10K *11/16*; H04R *1/28*

U.S. Cl. 381—71 **7 Claims**



1. An active sound control system, comprising a first sound detection system arranged to be representative of an unwanted sound wave which it is desired to attenuate, a sound generating system, a signal processing system via which a signal derived from the detection system is arranged to be fed to the generating system so as to generate a cancelling sound wave which interferes destructively with the unwanted wave in a selected spatial region, a second sound detection system located at an observation point suitable for monitoring the performance of the control system, means for effecting a sequence of measurement operations each of which defines over a given frequency range the transfer function between the respective outputs of the first and second detection systems, and means for making a sequence of adjustments of the signal processing system such that the Rth adjustment is made between the (R+1)th and (R+2)th measurement operations and causes the transfer function of the signal processing system to have at any frequency in said range a value substantially equal to $(T_R P_{R+1} - T_{R+1} P_R)/(P_{R+1} - P_R)$, where T_R and T_{R+1} represent the values at said frequency which the transfer function of the signal processing system had respectively on the occasions of the Rth and (R+1)th measurement operations, and P_R and P_{R+1} respectively represent the corresponding values in respect of said transfer function between the outputs of the two detection systems.

4,596,034

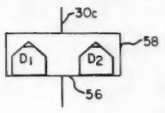
SOUND REPRODUCTION SYSTEM AND METHOD

J. Peter Moncrieff, 2449 Dwight Way, Berkeley, Calif. 94704

Continuation-in-part of Ser. No. 222,256, Jan. 2, 1981, abandoned. This application Mar. 22, 1982, Ser. No. 360,239

Int. Cl.[4] H04R *1/02, 3/00*

U.S. Cl. 381—89 **13 Claims**



1. A sound reproduction system for providing sound to a defined listening area, said system comprising

a common audio input for a single channel electrical audio signal,

first and second transducer means, each of which generates an acoustical output in response to the single channel electrical audio signal impressed on said audio input, each of which has a sound pressure distribution pattern characterized by a sound pressure lobe directed forwardly of said transducer means on a forward axis defined by the sound pressure maximum, and each of which is adapted to reproduce substantially the full audio frequency range of said sound reproduction system wherein the audio frequency range of said system includes at least a portion of the audio frequency spectrum above low frequencies,

said first and second transducer means further being responsive to the single channel electrical audio signal to said audio input and being electrically connected in opposite phase polarities with respect to said common audio input so that the acoustical output of said first transducer means is substantially 180° out of phase from the acoustical output from said second transducer means, and

structural means for supporting said first and second transducer means in a closely spaced, side by side, relation whereby the forward axes of the sound pressure lobes of said first and second transducer means have a substantial closely spaced, single channel component in the same direction.

4,596,035

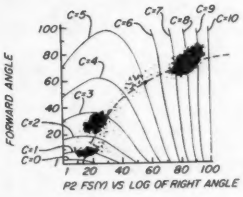
METHODS FOR ENUMERATING 3-PART WHITE CELL DIFFERENTIAL CLUSTERS

Russell J. Gershman, Middleboro; Irving L. Weiner, Sharon, and Arthur C. Daniels, Canton, all of Mass., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Jun. 27, 1983, Ser. No. 508,448

Int. Cl.[4] G01N *33/48, 21/64*; G06K *9/00*

U.S. Cl. 382—6 **3 Claims**



1. A method for transforming forward light scatter and right angle light scatter parameter measurements into a combined one dimensional parameter for quantifying cellular subclasses of a sample comprising:

(a) passing the cells, to be differentiated into subpopulations

and counted, through a zone illuminated by a focused light source, substantially one at a time;

(b) detecting light scattered by the passage of said cells through said zone in a substantially forward angle direction;

(c) further detecting light scattered by the passage of said cells through said zone at a substantially right angle direction whereby each cell may be represented by a forward angle light scatter and a right angle light scatter measurement;

(d) formulating a trajectory for connecting the cells represented by said forward angle and right angle light scatter measurements;

(e) determining a series of lines orthogonal to said trajectory describable by a nonlinear function; and

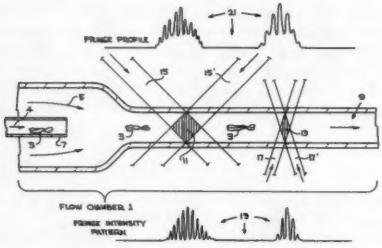
(f) counting the cells along each of said orthogonal lines whereby cellular subpopulations may be enumerated.

4,596,036

METHOD AND APPARATUS FOR FRINGE-SCANNING CHROMOSOME ANALYSIS

Richard M. Norgren, Palo Alto; Joe W. Gray, and Tomas B. Hirschfeld, both of Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 31, 1983, Ser. No. 528,284
Int. Cl.[4] G06K *9/00*; G01N *15/02*
U.S. Cl. 382—6 **14 Claims**



1. A method for determining the longitudinal morphology of oblong microscopic particles, each oblong microscopic particle having a longitudinal axis, the method comprising the steps of:

(a) suspending the oblong microscopic particles in a carrier fluid;

(b) constraining the oblong microscopic particles to sequentially flow along a flow path which is substantially the same for every oblong microscopic particle and in which the longitudinal axis of each oblong microscopic particle is oriented to be substantially parallel to the flow path;

(c) generating a fringe intensity pattern, the fringe intensity pattern having a plurality of fringes, each being disposed substantially perpendicularly to the flow path;

(d) detecting and recording a fringe profile as an oblong microscopic particle passes through the fringe intensity pattern; and

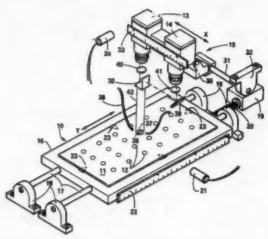
(e) deconvolving the fringe intensity pattern from the fringe profile to obtain information about the longitudinal morphology of the oblong microscopic particle.

4,596,037

VIDEO MEASURING SYSTEM FOR DEFINING LOCATION ORTHOGONALLY

Donald R. Bouchard; John L. Danton; Kevin A. Dawson, all of Endicott, and David J. Sloma, Johnson City, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1984, Ser. No. 588,012
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 **6 Claims**



1. Apparatus for determining the location of a hole in a circuit panel comprising:

imaging means for generating a plurality of scan signals having magnitudes representative of features of the hole in the circuit panel;

means for generating pulses at a fixed frequency;

first accumulator means for accumulating said pulses during a first portion of each of the scan signals representative of a distance from a reference position to a boundary point of the hole;

second accumulator means for accumulating said pulses during a second portion of each of the scan signals representative of a distance across the hole;

means responsive to the magnitudes of the scan signals for gating said pulses to the appropriate one of the first or second accumulator means;

means for comparing each value accumulated by the second accumulator means to a preset minimum value and for discarding values accumulated by the first and the second accumulator means if the value accumulated by the second accumulator means is less than the preset minimum value; and

processor means for first selecting certain values accumulated by the first and the second accumulator means based on the expected size of the hole, to provide a representative sample of the features in the approximate center of the hole represented by the magnitudes of the scan signals, and for then processing only said selected values to determine the location of the hole in the circuit panel.

4,596,038

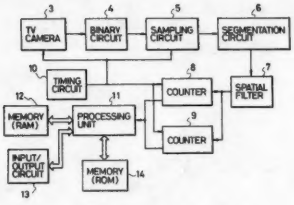
METHOD AND APPARATUS FOR CHARACTER RECOGNITION

Yutaka Yoshida, Hikari, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 582,774
Claims priority, application Japan, Feb. 23, 1983, 58-27547
Int. Cl.[4] G06K *9/18*
U.S. Cl. 382—11 **12 Claims**

1. A character recognition method comprising the steps of: optically scanning a character to be recognized which is formed of an ordinary character on which there is provided a plurality of marks characterizing said character; converting the image of marked character to an electrical image signal; extracting only those signal portions relating to the marked portions of the character from said image signal; and discriminating said character by comparing the image information of said marked portions with standard information relating to

standard image patterns stored in advance, wherein said marks are formed on said character in the outline of a polygon and said character recognition is conducted by comparing the coordinates of the center of gravity of such polygon formed by

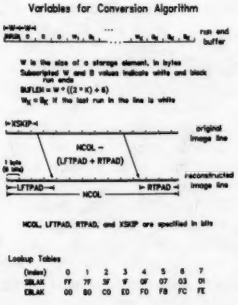


the arrangement of said marked portions to the coordinates of the center of gravity of marks formed on various standard characters to select a standard character corresponding to said optically scanned character.

4,596,039
METHOD FOR CONVERTING AN IMAGE FROM A RUN END OR RUN LENGTH REPRESENTATION TO A BIT MAP

Joan L. Mitchell, Ossining, and Karen L. Anderson, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,292
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—56 **20 Claims**


Variables for Conversion Algorithm
run end buffer
W is the size of a storage element, in bytes
Subscripted W and B values indicate white and black run ends
BUFLEN = W * ((2 * X) + 6)
W0 = B0 if the last run in the line is white
XSKIP
original image line
NCOL = (LFTPAD + RTPAD)
1 byte (8 bits)
reconstructed image line
LFTPAD
NCOL
RTPAD
NCOL, LFTPAD, RTPAD, and XSKIP are specified in bits
Lookup Tables
(Index) 0 1 2 3 4 5 6 7
SBLAK FF 7F 3F 1F 0F 07 03 01
EBLAK 00 80 C0 E0 F0 F8 FC FE

1. A method for converting data representing a binary image from run representation form to bit map form, comprising the steps of:

initializing to a first binary value all of the bits in an output area where the bit map is to be formed;

storing data comprising a plurality of pairs of run representations of said image in a buffer, each of said pairs defining the beginning and the end of a run of image bits of a second binary value;

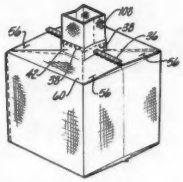
converting each of said pairs of run representations stored in said buffer successively to strings of image bits of said second binary value; and

transferring said strings of image bits of said second binary value to said output area into positions offset in accordance with the respective beginning positions of said strings as indicated by said run representations, such that said image data is converted to a bit map representation in said output area without the need for creating and transferring strings of image bits of said first binary value.

4,596,040
LARGE BULK BAG

Arthur E. LaFleur; Arnie LaFleur, and Lee LaFleur, all of Manistee, Mich., assignors to Custom Packaging Systems, Manistee, Mich.

Continuation-in-part of Ser. No. 430,809, Sep. 30, 1982, abandoned. This application Sep. 1, 1983, Ser. No. 528,604
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—7 **25 Claims**



1. A collapsible bag which, when collapsed, comprises a flat tubular blank of a flexible material and having a pair of flat overlying panels adapted to form a pair of opposite side walls of the bag and a pair of folded gusset panels extending inwardly between the flat panels from the opposite side edges of the panels and adapted to form two other opposite side walls of the bag, said blank having adjacent one end thereof each flat panel and the adjacent gusset panel connected together along lines extending diagonally inwardly from the opposite side edges of the panels toward said one end of the tubular blank, said diagonal lines of connection terminating at their laterally inner ends in spaced apart relation laterally outwardly of the inner folded edges of the gusset panels at points spaced from said one end of the blank, each flat panel and the adjacent gusset panel also being connected together along a line extending lengthwise of the blank from said points of termination of the diagonal lines to said one end of the blank, each flat panel and the adjacent gusset panel being severed along lines spaced laterally outwardly of and generally co-extensive in length with said lengthwise extending lines of connection to form, when the blank is opened, a spout of rectangular cross section at said end of the bag, each corner of the spout being defined by one of said lengthwise extending connection lines, the portions of the flat and gusset panels lying between said diagonal connection lines forming, when the blank is open, a generally flat rectangular end wall on the bag with said spout at the center thereof, said diagonal lines of connection extending from the corners of the spout to the corners of said end wall and when said tubular blank is open, said panels provide a bag of generally rectangular cross section with said end wall generally transverse to said panels and having a spout therein and when said tubular blank is collapsed it folds into a generally flat and compact bag.

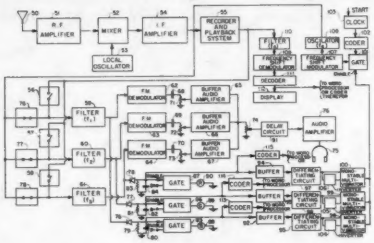
4,596,041
PARTICIPANT-IDENTIFICATION RECORDING AND PLAYBACK SYSTEM

John L. Mack, 4638 S. 30th Rd., Arlington, Va. 22206

Filed Jun. 17, 1983, Ser. No. 505,442
Int. Cl.[4] H04B *1/00, 7/00*
U.S. Cl. 455—53 **6 Claims**

1. A participant-identification recording and playback system comprising a plurality of wireless microphones, each of said microphone including a respective radio transmitter for broadcasting a respective signal modulated with a respective audio signal representing speech of a respective participant and a distinctive participant-identification signal; radio receiving means responsive to signals received from said radio transmitters for producing output signals which include signals carrying respective modulation representing speech of respective participants and respective signal characteristics representing identity of respective participants; recording and playback

means for recording and playing back the output signals; means responsive to output from said recording and playback means for deriving audio signals therefrom representative of speech signals of respective participants and signals identifying



respective participants; means for producing time signals and means responsive to said output signals from said receiving means for feeding the time signals to said recording and playback means whenever any participant starts to speak and whenever any participant stops speaking.

4,596,042

RADIO TRANSMISSION METHOD FOR A MOBILE RADIO SYSTEM

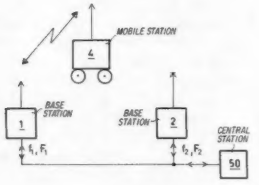
Horst Stangl, Brugg, Switzerland, assignor to BBC Brown, Boveri & Co., Limited, Baden, Switzerland

Filed Dec. 8, 1983, Ser. No. 559,262

Claims priority, application European Pat. Off., Dec. 21, 1982, 82201641.6

Int. Cl.[4] H04B *1/00, 7/00*

U.S. Cl. 455—56 **8 Claims**



8. A radio transmission method for a mobile radio system, wherein for the purpose of establishing a radio link between a central station and a mobile station at least two base stations defining at least adjacent service areas are provided, said base stations each including a transmitter and a receiver and exchanging low-frequency signals with the central station, comprising:

said mobile station itself selecting at least one of said base stations for establishing a radio link between said mobile station and the central station; and

keying the transmitter of only the selected base station for maintenance of said radio link with said mobile station;

wherein after a radio link has been established between the mobile station and the central station via a selected base station, the method further comprises:

locking out the remaining base stations; and

said mobile station transmitting a selective call to the central station to be used by said central station as an acknowledgement signal indicating establishment of said radio link.

4,596,043

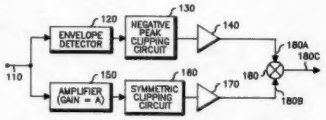
HIGH EFFICIENCY RADIO FREQUENCY SIGNAL AMPLIFIER FOR AMPLIFYING MODULATED RADIO FREQUENCY SIGNALS IN A MANNER GENERATING MINIMAL SPLATTER

Clifford D. Leitch, North Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 363,178, Mar. 29, 1982, abandoned. This application Oct. 7, 1983, Ser. No. 540,211

Int. Cl.[4] H04B *1/04*

U.S. Cl. 455—91 **21 Claims**



1. A radio frequency signal processing circuit comprising:

first channel means, having an input and an output, for processing modulated radio frequency signals provided thereto including;

envelope signal generating means, coupled to the input of said first channel means, for generating a rectified envelope signal from said modulated signals;

peak clipping means, coupled to said envelope signal generating means, for clipping portions of said rectified envelope signal which exhibit an instantaneous voltage level the absolute value of which is less than a first selected voltage threshold level, V_{T1}, said peak clipping means otherwise allowing said rectified envelope signal to remain unclipped, thus generating a clipped rectified envelope signal;

first amplifying means, coupled to the output of said peak clipping means, for amplifying said clipped rectified envelope signal to generate a first channel output signal at the output of said first channel means;

second channel means, having an input coupled to the input of said first channel means, for processing modulated radio frequency signals provided thereto including;

symmetrical clipping means, coupled to the input of said second channel means, for symmetrically clipping portions of said modulated radio frequency signals which exhibit an instantaneous voltage level the absolute value of which exceeds a second threshold voltage level, V_{T2}, said second threshold voltage level, V_{T2}, being selected such that said symmetrical clipping means clips said modulated radio frequency signals in said second channel means when said peak clipping means allows said rectified envelope signals in said first channel means to remain unclipped and such that said symmetrical clipping means allows the modulated radio frequency signals in said second channel means to remain unclipped when said peak clipping means clips the rectified envelope signal in said first channel means, thus generating a symmetrically clipped signal having clipped and unclipped portions;

second amplifying means, coupled to said symmetrical clipping means and operatively coupled to the output of said first channel means such that the first channel output signal modulates signals amplified by said second amplifying means, said second amplifying means being operative in a first mode for linearly amplifying the unclipped portions of said symmetrically clipped signal and being operative in a second mode for amplifying the clipped portions of said symmetrically clipped signal in a highly efficient non-linear manner,

whereby an amplified modulated radio frequency signal exhibiting minimal splatter components is generated.

4,596,044

UHF-VHF COMBINATION TUNER

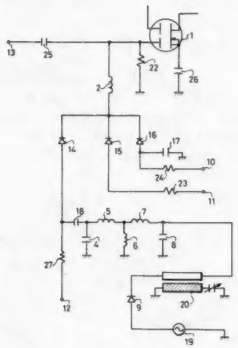
Kazuharu Aoki, and Masahiko Saito, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Oct. 13, 1983, Ser. No. 541,519

Claims priority, application Japan, Oct. 13, 1982, 57-154659[U]

Int. Cl.[4] H04B *1/16*; H03J *3/00*

U.S. Cl. 455—189 **5 Claims**



1. A UHF-VHF combination tuner for receiving low-range VHF, high-range VHF, and UHF signals comprising:

a VHF tuner;

a first mixer stage coupled to the VHF tuner, where the first mixer stage operates as a mixer for the VHF tuner when low-range VHF or high-range VHF signals are being received, and operates as an IF amplifier when UHF signals are being received, said first mixer stage having a first input terminal;

a bias resistor connected to the first input terminal;

a coil having a first end connected to the first input terminal, said coil forming a resonance circuit together with the inherent input capacitance of said first input terminal of the first mixer stage when high-range VHF signals are being received;

a first switching diode connected to a second end of the coil, where said first switching diode is biased in a conducting state when high-range VHF signals are being received so that the coil forms a resonance circuit together with said inherent input capacitance of the first input terminal, and where said first switching diode is in a high impedance state when high-range VHF signals are not being received;

a UHF tuner coupled to the second end of said coil so that the coil operates as a low-pass filter in series with an output of said UHF tuner and the first input terminal of said first mixer stage.

4,596,045

INPUT CIRCUIT FOR TELEVISION RECEIVER

Gerhard Maier, Dauchingen, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen, Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,611

Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318197

Int. Cl.[4] H04B *1/16*

U.S. Cl. 455—189 **14 Claims**

1. A circuit for television receivers comprising

a first power source;

a first switch connected to the first power source for connecting the first power source;

a first amplifier for an incoming ultra high frequency signal;

a first mixing stage connected to the first amplifier;

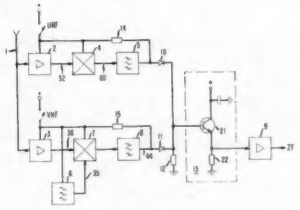
a first intermediate-frequency bandpass filter connected to the first mixing stage;

a first decoupling diode connected to the output of the first intermediate-frequency bandpass filter and to the switch for being turned on and off depending on the switch position;

a second power source;

a second switch connected to the second power source for connecting the second power source;

a second amplifier for an incoming very high frequency signal;



a second mixing stage connected to the second amplifier;

a second intermediate-frequency bandpass filter connected to the second mixing stage;

a second decoupling diode connected to the output of the second intermediate-frequency bandpass filter and to the second switch for being turned on and off depending on the second switch position;

an impedance transformer connected to the first decoupling diode and to the second decoupling diode; and

an intermediate-frequency amplifier connected to the output of the impedance transformer.

4,596,046

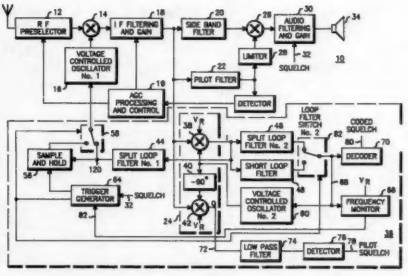
SPLIT LOOP AFC SYSTEM FOR A SSB RECEIVER

Julian H. Richardson, Clevedon, England, and Bruce C. Eastmond, Downers Grove, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1984, Ser. No. 656,551

Int. Cl.[4] H04B *1/26*

U.S. Cl. 455—260 **11 Claims**



1. An improved split loop automatic frequency control system for a single sideband receiver operating on a received pilot with squelch activation information, said system comprising in combination;

a split phase locked loop comprising

a first and second voltage controlled oscillator each having a first and second control means for loop control;

means for locking said first and second voltage controlled

oscillator to said received pilot each using said first control means;

means for generating a first control signal whenever said second voltage controlled oscillator resides in a specified range of said pilot;

means for detecting transmitted squelch activation information and generating a second control signal therefrom;

means responsive to the presence of said first and second control signals to connect said first and second voltage controlled oscillators to the respective second control means and reestablish connection thereof to the respective first control means upon the absence of either said first or second control signals.

4,596,047

SATELLITE BROADCASTING RECEIVER INCLUDING A PARABOLIC ANTENNA WITH A FEED WAVEGUIDE HAVING A MICROSTRIP DOWN CONVERTER CIRCUIT

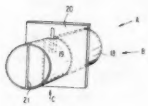
Hiroshi Watanabe, and Eiji Aoki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1982, Ser. No. 411,786

Claims priority, application Japan, Aug. 31, 1981, 56/136441; Sep. 29, 1981, 56/154363

Int. Cl.[4] H04B *1/18*

U.S. Cl. 455—281 13 Claims



1. A satellite broadcasting receiver comprising a parabolic antenna having a focus, a circular waveguide provided close to said focus of said parabolic antenna for receiving an electromagnetic wave caught by said parabolic antenna, a microwave circuit for processing the received electromagnetic wave, said microwave circuit having a strip line and being disposed on a printed circuit board having an aperture therein through which said circular waveguide passes, and a mode converter between said circular waveguide and said strip line, said mode converter including a strip-line-shaped probe connected to said strip-line of said microwave circuit and projecting into said circular waveguide within said aperture and a reflecting element provided in said waveguide downstream of said probe.

4,596,048

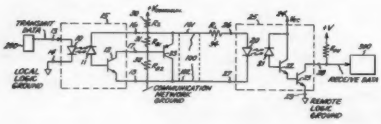
OPTICALLY ISOLATED CONTENTION BUS

Robert J. Dunki-Jacobs, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1983, Ser. No. 482,103

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—602 33 Claims



1. A communication system comprising:

(a) transmission means coupled to an electrical local logic ground and operative to transmit distinct first and second data signals;

(b) receiving means coupled to an electrical remote logic ground for receiving said first and second data signals;

(c) a logical contention bus having an electrical network ground, said bus being adapted to be in data communication with said transmission means and said receiving means, said bus including first and second branches, said second branch being coupled to said network ground;

(d) first and second isolation means coupled to said bus for electrically isolating said network ground from said local logic ground and said remote logic ground, respectively; and

(e) switching means coupled to said first isolation means, said first branch and said second branch, for receiving said first and second data signals, said switching means being adapted to couple said first branch to said second branch upon receipt of and irrespective of the duration of said first data signal.

4,596,049

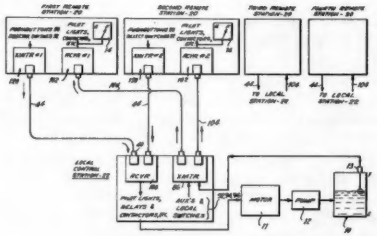
ELECTRICAL CONTROL SYSTEM

Alfred E. Rizzotti, III, New Rochelle, N.Y., assignor to Ward Leonard Electric Co., Inc., Mount Vernon, N.Y.

Filed Dec. 9, 1983, Ser. No. 559,908

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—603 19 Claims



1. An electrical control system for controlling the operation of one or more electrical devices comprising

a local control station and at least one remote control station;

each of said local control stations comprising transmitter means and receiver means, and each of said remote control stations comprising transmitter means and receiver means;

first optical fiber means interconnecting said remote station transmitter means and said local station receiver means,

and second optical fiber means interconnecting said local station transmitter means with said remote station receiver means,

said remote station transmitter means including command means for generating electrical command words, and

first converting means for converting said electrical command words into corresponding light command words;

said remote station transmitter means including first coupling means for coupling said light command words to the input end of said first optical fiber means;

said local station receiver means including second coupling means for coupling the output end of said first optical fiber means to said local station receiver means and

second converting means for converting said light command words into corresponding serial bit stream electrical command signals;

decoder means for decoding said serial bit stream command signals into data command information words;

a logic control unit comprising microprocessor means and erasable programmable memory means for processing said data command information words;

driver circuit means for driving said electrical devices in accordance with said data command information;

local station monitoring means for monitoring the operation of said electrical devices and producing corresponding electrical control information signals;

third converting means for converting said electrical control information signals into corresponding light control information signals;

third coupling means for coupling said light control information signals to the input end of said second optical fiber means;

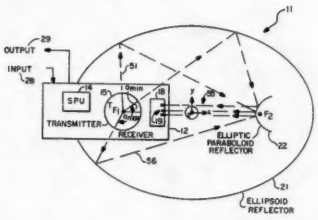
fourth coupling means for coupling the output end of said second optical fiber means to said remote station receiver means; and

fourth converter means for converting said light control information signals into electrical control information signals.

4,596,050
INFORMATION PROCESSING SYSTEM USING OPTICALLY ENCODED SIGNALS

Gordon W. Rogers, 19714 Ayers Ave., Escalon, Calif. 95320

Filed Apr. 26, 1984, Ser. No. 604,024
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—607 **13 Claims**



1. In an information processing system:

means defining an internal reflecting surface in the shape of an ellipsoid having first and second focal points;

optical signal processing means including means for simultaneously transmitting a plurality of distinct optically encoded signals along various distinct paths, a portion of each said path coinciding with a line emanating from a first one of said focal points, whereby said signals are reflected from said reflecting surface towards the second one of said focal points; and

optical signal receiving means for collecting said signals, after reflection from said ellipsoid reflecting surface, for further processing;

wherein

at least a part of said optical signal processing means is located at or around said first focal point of said ellipsoid reflector; and

said optical signal receiving means includes optical routing means for reflecting optically encoded signals converging on said second focal point back to said optical signal processing means.

4,596,051
OPTICAL INTERFACE TO AN ELECTRICAL CENTRAL OFFICE

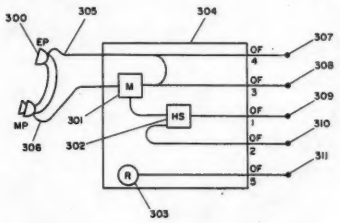
Nathan W. Feldman, 910 Van Court Ave., Long Branch, N.J. 07740

Filed Aug. 29, 1983, Ser. No. 527,054
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—614 **7 Claims**

1. An optical to electrical, telephone system interface device comprising:

light port means for transceiving light upon light conductive lines said lines being connected to an optical telephone device for transceiving light therebetween;

electrical port means for transceiving first electrical signals upon electrically conductive lines, said, lines being connected to an electrical central office system;



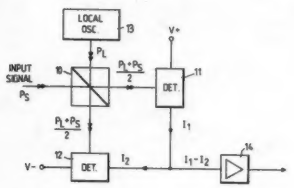
transducing means connected to both said port means for transducing between light energy and electrical analog signal energy, or vice versa; and

electrical control means interposed between said electrical port means and said transducing means for conversion of signals transceived therebetween.

4,596,052
COHERENT OPTICAL RECEIVER

Stephen Wright, Finsbury Park, England, and Philip R. Couch, Roanoke, Va., assignors to International Standard Electric Corporation, New York, N.Y.

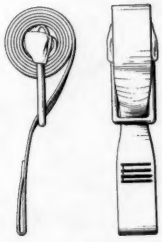
Filed May 20, 1983, Ser. No. 496,747
Claims priority, application United Kingdom, May 20, 1982, 8214733
Int. Cl.⁴ H04B 9/00
U.S. Cl. 455—619 **7 Claims**



1. A coherent optical receiver for optical input signal at a basic frequency having modulation imposed thereon as frequency modulation, comprising a local oscillator source of a coherent optical local oscillator signal at a frequency substantially corresponding to the basic frequency of the input signal; mixing means to which both the input and local oscillator signals are applied to produce two coherently combined optical signals which both vary in intensity in dependence on the frequency modulation but differ from each other in phase in such a manner that those components of the combined optical signals which vary with the local oscillator signal power are in-phase while those components which vary with the frequency modulation are in antiphase with one another; a pair of substantially identical photodetectors each having an input connected to a different one of two points of different electrical potentials and an output, each photodetector receiving one of the combined optical signals and generating in response thereto an electrical output signal containing electrical equivalents of said components of the respective combined optical signal, said electrical output signal appearing at said output of the respective photodetector; and means for providing a resultant output signal representative of the difference between said electrical output signals appearing at said outputs of said photodetectors with attendant elimination of the in-phase components from and addition of the antiphase components of the electrical output signals in said resultant output signal.

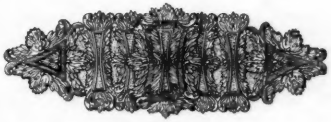
284,228
FROZEN CONFECTION
Wolfgang Keibl, Vienna, Austria, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.
Filed Aug. 3, 1983, Ser. No. 519,833
Term of patent 14 years
U.S. Cl. D1—102

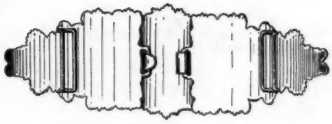
284,229
COMBINED ADJUSTABLE JAM NUT AND WEB SLING FOR CLIMBERS
William E. Forrest, Denver, Colo., assignor to Forrest Mountaineering, Ltd., Denver, Colo.
Filed Apr. 27, 1984, Ser. No. 604,634
Term of patent 14 years
U.S. Cl. D2—380



284,230
BELT BUCKLE
Alexis V. Kirk, 160 E. 38th St., New York, N.Y. 10016
Filed Nov. 28, 1984, Ser. No. 675,948
Term of patent 14 years
U.S. Cl. D2—405

284,231
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Apr. 23, 1984, Ser. No. 603,106
Term of patent 14 years
U.S. Cl. D2—422

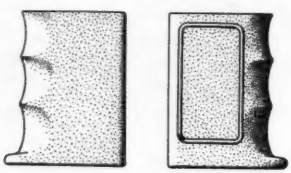




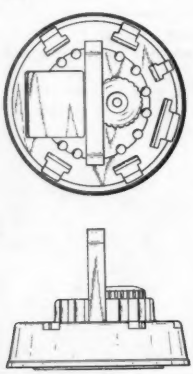
284,232
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Dec. 21, 1984, Ser. No. 684,701
Term of patent 14 years
U.S. Cl. D2—422

284,233
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Mar. 29, 1984, Ser. No. 594,573
Term of patent 14 years
U.S. Cl. D2—442

284,234
UMBRELLA HANDLE
James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Filed Dec. 23, 1983, Ser. No. 564,934
Term of patent 14 years
U.S. Cl. D3—12

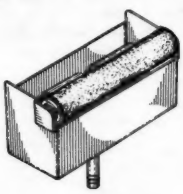


284,235
CADDY FOR TOY HAND STAMPS AND CRAYONS
Christine M. Zinter-Chahin, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,489
Term of patent 14 years
U.S. Cl. D3—74



284,236
TOOTHBRUSH
Georges Collet, P.O. Box - Aptdo 19.000, Caracas 1014-A, Venezuela
Filed Dec. 23, 1983, Ser. No. 564,736
Term of patent 14 years
U.S. Cl. D4—104

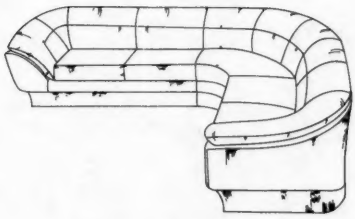
284,237
PAINT APPLICATION DEVICE
Louis Cliche, 1240 Saint-Ange St., Sainte-Foy, Quebec, Canada G2E 3L9
Filed Nov. 17, 1983, Ser. No. 552,811
Term of patent 14 years
U.S. Cl. D4—122



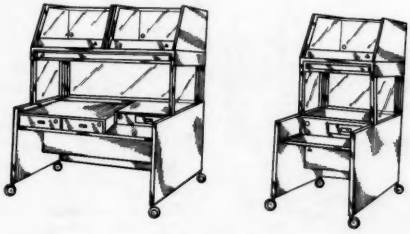
284,238
CHAIR
Stephen Crowley, 8019 Le Nado Rd., Woody Creek, Colo. 80005
Filed Dec. 20, 1983, Ser. No. 563,317
Term of patent 14 years
U.S. Cl. D6—379

284,239
CHAIR
Anthony F. Albanese, Upper Montclair, N.J., assignor to I.P.F. International, Inc., Paterson, N.J.
Filed Nov. 3, 1983, Ser. No. 548,443
Term of patent 14 years
U.S. Cl. D6—380

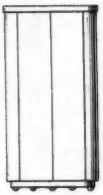
284,240
SOFA OR SIMILAR ARTICLE
Randy R. Culler, High Point, N.C., assignor to Carson's, Inc., High Point, N.C.
Filed Oct. 25, 1985, Ser. No. 791,452
Term of patent 14 years
U.S. Cl. D6—381

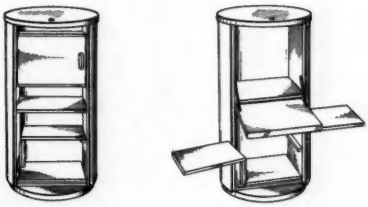


284,241
COMPUTER CONSOLE
Antonio M. Fernandez, 1009 87th St., Apt. C5, North Bergen, N.J. 07047
Filed Nov. 14, 1983, Ser. No. 551,593
Term of patent 14 years
U.S. Cl. D6—421

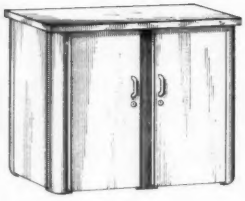


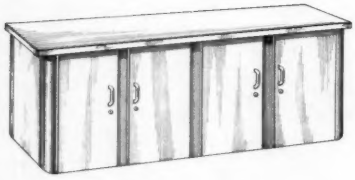
284,242
EXECUTIVE WORK CENTER
Robert L. Sackett, Downey; John S. Reistetter, Los Angeles; Henry A. Goldman, Northridge, and Albert P. De Fusco, Woodland Hills, all of Calif., assignors to Artisan House, Inc., Los Angeles, Calif.
Filed Aug. 29, 1983, Ser. No. 527,107
Term of patent 14 years
U.S. Cl. D6—430





284,243
MODULAR CABINET
Steven C. Barber, 18900 Highland Ave., Deephaven, Minn. 55391
Filed Mar. 23, 1984, Ser. No. 592,889
Term of patent 14 years
U.S. Cl. D6—432

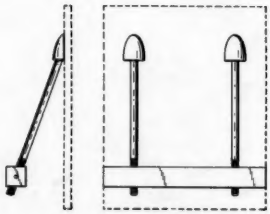




284,244
ETAGERE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Jul. 11, 1983, Ser. No. 512,357
Term of patent 14 years
U.S. Cl. D6—474

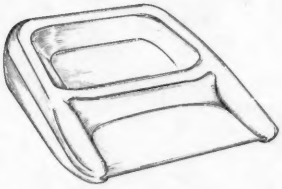
284,245
END STANDARD FOR A MODULAR SHELVING UNIT
Dean K. Santner, P.O. Box 88185, Emeryville, Calif. 94662
Filed Apr. 18, 1983, Ser. No. 485,604
Term of patent 14 years
U.S. Cl. D6—491

284,246
SUPPORT STRUT FOR A MODULAR WORKSPACE SYSTEM
Dean K. Santner, P.O. Box 88185, Emeryville, Calif. 94662
Filed Apr. 18, 1983, Ser. No. 485,853
Term of patent 14 years
U.S. Cl. D6—491



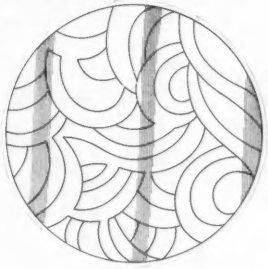
284,247
TISSUE DISPENSER
Lewis Fine, 618 Boca Marina Ct., Boca Raton, Fla. 33432
Filed Sep. 12, 1983, Ser. No. 530,958
Term of patent 14 years
U.S. Cl. D6—522

284,248
PILLOW
Judith B. Challen, 8 Hicks Crescent, Echuca, Victoria, Australia 3625
Filed Mar. 26, 1984, Ser. No. 593,366
Claims priority, application Australia, Oct. 12, 1983, 5308/83
Term of patent 14 years
U.S. Cl. D6—601

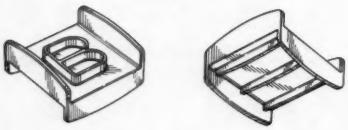


284,249
BEVERAGE STEIN
Donald L. Bolich, 1136 Birdie Rd., Broomfield, Colo. 80020
Filed Nov. 14, 1983, Ser. No. 550,792
Term of patent 14 years
U.S. Cl. D7—5

284,250
DECAL FOR USE ON CHINA DINNERWARE OR SIMILAR ARTICLES
Helen Zughaib, Jamesville, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Division of Ser. No. 477,848, Mar. 22, 1983, Pat. No. D. 281,043. This application Jul. 31, 1985, Ser. No. 760,913
Term of patent 14 years
U.S. Cl. D7—39

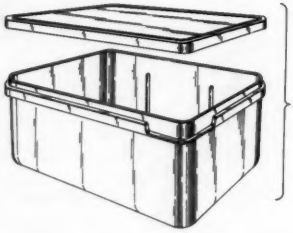


284,251
BUTTER STAMP OR THE LIKE
David J. Stricker, Salem, Mass., assignor to Dart & Kraft, Inc., Northbrook, Ill.
Filed Jan. 16, 1984, Ser. No. 571,017
Term of patent 14 years
U.S. Cl. D7—43

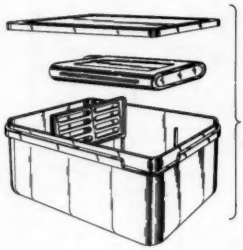


284,252
SEASONING SHAKER MILLS
Uwe Lichtenvort, Hamburgerstr. 48, 43 Essen, Fed. Rep. of Germany
Filed Jul. 22, 1983, Ser. No. 516,083
Term of patent 14 years
U.S. Cl. D7—53

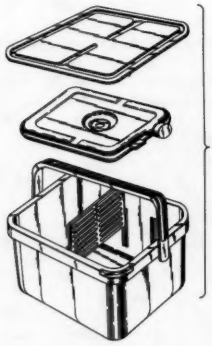
284,253
CONTAINER
Arthur R. Carlson, East Malvern, Australia, assignor to The Decor Corporation Proprietary Ltd., Scoresby, Australia
Filed Mar. 22, 1983, Ser. No. 477,607
Claims priority, application Australia, Sep. 24, 1982, 1650/82
Term of patent 14 years
U.S. Cl. D7—76



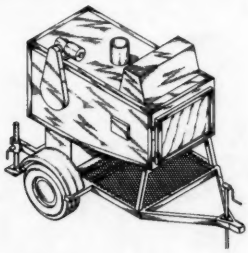
284,254
LUNCH BOX
Arthur R. Carlson, East Malvern, Australia, assignor to The Decor Corporation Pty Ltd., Scoresby, Australia
Filed Mar. 22, 1983, Ser. No. 477,675
Claims priority, application Australia, Sep. 24, 1982, 1646/82; Sep. 24, 1982, 1648/82; Sep. 24, 1982, 1650/82
Term of patent 14 years
U.S. Cl. D7—76



284,255
HAMPER
Arthur R. Carlson, East Malvern, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed Mar. 22, 1983, Ser. No. 477,673
Claims priority, application Australia, Sep. 24, 1982, 1645/82; Sep. 24, 1982, 1646/82; Sep. 24, 1982, 1647/82; Sep. 24, 1982, 1649/82
Term of patent 14 years
U.S. Cl. D7—77

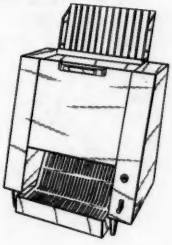


284,256
PORTABLE BARBEQUE
J. D. Moncrief, 3139 Woodmark Ct., Sacramento, Calif. 95821
Filed Aug. 30, 1984, Ser. No. 645,598
Term of patent 14 years
U.S. Cl. D7—334

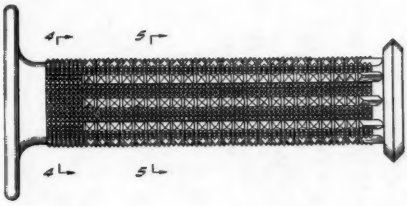


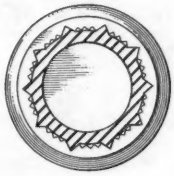
284,257
COOKING KETTLE
Francis J. Greb, Buffalo Grove, and Robert S. Huff, Oak Park, both of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Sep. 6, 1983, Ser. No. 529,581
Term of patent 14 years
U.S. Cl. D7—355

284,258
CONTINUOUS FOOD COOKER
Dye O. Miller, 1815 Pheasant Trail, Mount Prospect, Ill. 60056; August J. Antunes, 143 E. Jackson St., Elmhurst, Ill. 60126, and Jerome Antunes, 21 Clubside Dr., Clarendon Hills, Ill. 60514
Filed Oct. 14, 1982, Ser. No. 434,349
Term of patent 14 years
U.S. Cl. D7—338



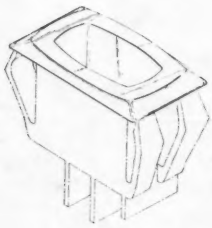
284,259
CYCLE HAND GRIP
William Oury, Green Mountain Falls, Colo., assignor to Oury Grip U.S.A., Inc., Wheaton, Ill.
Filed Aug. 6, 1984, Ser. No. 638,645
Term of patent 14 years
U.S. Cl. D8—303



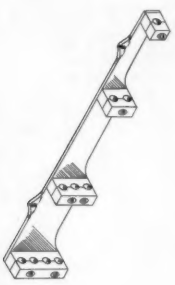


284,260
CONTROL PANEL FOR A COMBINATION LOCK FOR A LUGGAGE ARTICLE FRONT PANEL
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock, Inc., Garfield, N.J.
Division of Ser. No. 589,853, Mar. 16, 1984, which is a continuation of Ser. No. 240,877, Mar. 5, 1981, abandoned. This application Nov. 13, 1984, Ser. No. 670,927
Term of patent 14 years
U.S. Cl. D8—341

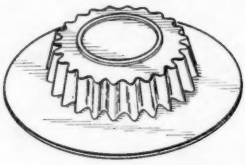
284,261
SWITCH CASE BEZEL
Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.
Filed Jan. 17, 1983, Ser. No. 458,670
Term of patent 14 years
U.S. Cl. D8—353



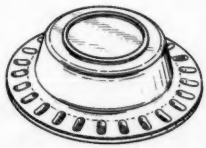
284,262
SPARK PLUG WIRE HARNESS
Ron Finley, Rte. 1, Wendell, Id. 83355
Filed Feb. 24, 1983, Ser. No. 439,889
Term of patent 14 years
U.S. Cl. D8—357



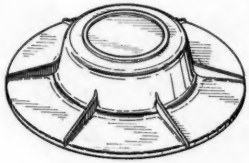
284,263
SCREWABLE CAP FOR A NON-PENETRATING FASTENER ASSEMBLY
Stevan A. Resan, Carlisle, Pa., assignor to Carlisle Corporation, Cincinnati, Ohio
Filed Jul. 30, 1984, Ser. No. 635,541
Term of patent 14 years
U.S. Cl. D8—382



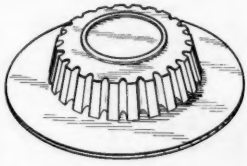
284,264
SCREWABLE CAP FOR A NON-PENETRATING FASTENER ASSEMBLY
Stevan A. Resan, Carlisle, Pa., assignor to Carlisle Corporation, Cincinnati, Ohio
Filed Jul. 30, 1984, Ser. No. 635,542
Term of patent 14 years
U.S. Cl. D8—382



284,265
SCREWABLE CAP FOR A NON-PENETRATING FASTENER ASSEMBLY
Stevan A. Resan, Carlisle, Pa., assignor to Carlisle Corporation, Cincinnati, Ohio
Filed Jul. 30, 1984, Ser. No. 635,543
Term of patent 14 years
U.S. Cl. D8—382

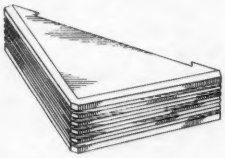


284,266
SCREWABLE CAP FOR A NON-PENETRATING FASTENER ASSEMBLY
Stevan A. Resan, Carlisle, Pa., assignor to Carlisle Corporation, Cincinnati, Ohio
Filed Jul. 30, 1984, Ser. No. 635,545
Term of patent 14 years
U.S. Cl. D8—382



284,267
WALL ANCHOR
Anders Lindell, Jönåker, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Jul. 22, 1983, Ser. No. 516,301
Claims priority, application Sweden, Jan. 27, 1983, 83-0228
Term of patent 14 years
U.S. Cl. D8—385

284,268
LOCKING BLOCK WITH ADHESIVE BASE TO ARREST SLIDING DOORS OR WINDOWS
Michel Dallaire, Montreal, and Robert Laroche, Ste-Julie, both of Canada, assignors to Vindas, Inc., Sillery, Canada
Filed Jul. 12, 1983, Ser. No. 512,976
Term of patent 14 years
U.S. Cl. D8—402



284,269
JAR
Michael K. Goettner, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Jan. 23, 1984, Ser. No. 572,789
Term of patent 14 years
U.S. Cl. D9—349

284,270
TOP CAP FOR CONTAINERS
Woodrow W. Pearce, 1601 Pueblo St., Glendale, Calif. 91207
Filed Dec. 28, 1983, Ser. No. 566,225
Term of patent 14 years
U.S. Cl. D9—454

284,271
COMBINED CLOCK AND THERMOMETER
Walter Henkels, Holunderweg 1, D-5142 Hückelhoven, Fed. Rep. of Germany
Filed Apr. 20, 1984, Ser. No. 602,523
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, MR 148
Term of patent 14 years
U.S. Cl. D10—4

284,272
IONIZATION CHAMBER FOR A SMOKE DETECTOR
Laurence Chen, 1116 Via Zumaya, Rancho Palos Verdes, Calif. 90274
Filed Aug. 9, 1984, Ser. No. 639,261
Term of patent 14 years
U.S. Cl. D10—106

284,273

HANGING ORNAMENT

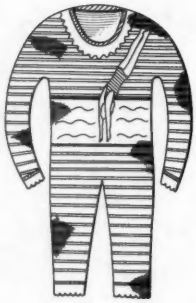
Brigitte Breyer-Lindner, Habichstrasse 34, D-8025 Unterhaching, Fed. Rep. of Germany

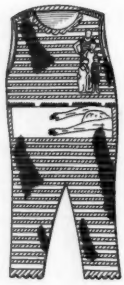
Continuation-in-part of Ser. No. 301,004, Sep. 10, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 566,771

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 11 AR 743/81

Term of patent 14 years

U.S. Cl. D11—133





284,274

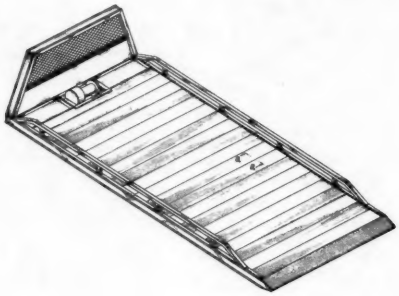
DECK FOR TRANSPORTER VEHICLE

Gary L. Shoup, Greencastle, Pa., assignor to Jerr-Dan Corporation, Greencastle, Pa.

Filed Sep. 30, 1982, Ser. No. 429,144

Term of patent 14 years

U.S. Cl. D12—94



284,275

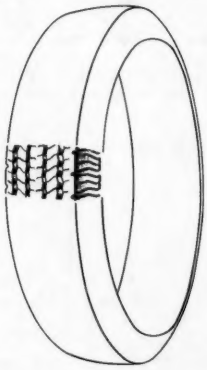
PNEUMATIC TIRE TREAD AND BUTTRESS

Gerasimos Candiliotis, Grosse Pointe Farms, Mich., assignor to Uniroyal Tire Company, Inc., Middlebury, Conn.

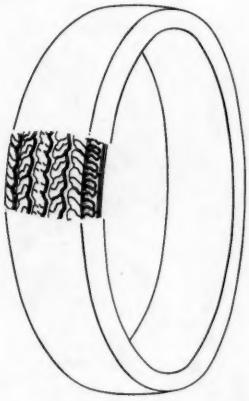
Filed Apr. 4, 1984, Ser. No. 596,757

Term of patent 14 years

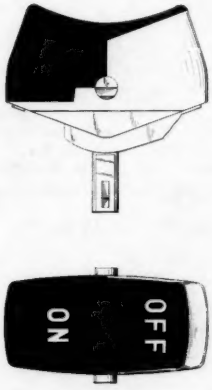
U.S. Cl. D12—142



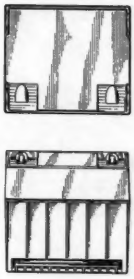
284,276
PNEUMATIC TIRE TREAD AND BUTTRESS
Gerasimos Candiliotis, Grosse Pointe Farms, Mich., assignor to Uniroyal Tire Company, Inc., Middlebury, Conn.
Filed Nov. 9, 1983, Ser. No. 550,680
Term of patent 14 years
U.S. Cl. D12—147



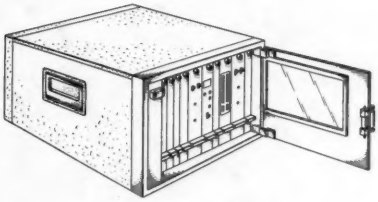
284,277
ELECTRIC SWITCH ROCKER
Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.
Filed Dec. 12, 1983, Ser. No. 560,208
Term of patent 14 years
U.S. Cl. D13—37



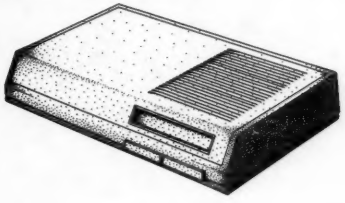
284,278
BATTERY CONTAINER
Roy E. Hennen, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.
Filed Jul. 5, 1983, Ser. No. 510,772
Term of patent 14 years
U.S. Cl. D13—9



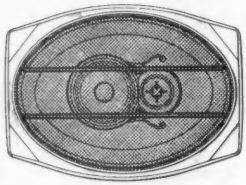
284,279
AUDIO DELAY/PREVIEW UNIT
Tsunehisa Ishii, Isehara, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed May 23, 1983, Ser. No. 497,109
Term of patent 14 years
U.S. Cl. D14—1



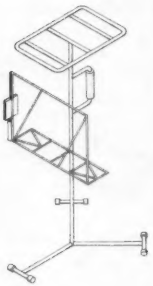
284,280
HOUSING FOR COMMUNICATION EQUIPMENT
Henry J. Mack, Jr., Levittown; John N. McGarvey, Drexel Hill, both of Pa.; Terrance J. Paas; Terry B. Prince, both of Indianapolis, Ind., and Michael P. Zambelli, Maplewood, N.J., assignors to AT&T Information Systems Inc., Indianapolis, Ind.
Filed Oct. 16, 1985, Ser. No. 787,858
Term of patent 14 years
U.S. Cl. D14—2

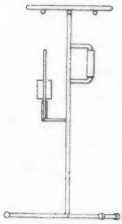


284,281
LOUDSPEAKER
You Takagi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 29, 1983, Ser. No. 509,085
Claims priority, application Japan, Jan. 7, 1983, 58-136
The portion of the term of this patent subsequent to May 27, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—30

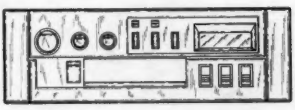


284,282
STAND FOR SUPPORTING A TELEPHONE AND DIRECTORY
Abraham Robinson, HHC 3rd Engineering Battallion, Fort Stewart, Ga. 31314
Filed Nov. 14, 1983, Ser. No. 551,180
Term of patent 14 years
U.S. Cl. D14—60

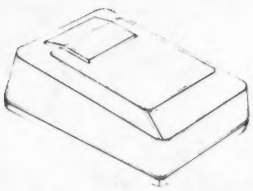




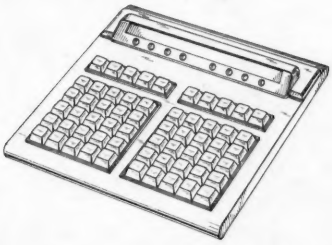
284,283
CAR RADIO
Petrus H. J. Van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 3, 1984, Ser. No. 576,657
Claims priority, application United Kingdom, Aug. 3, 1983, 1014466
Term of patent 14 years
U.S. Cl. D14—68



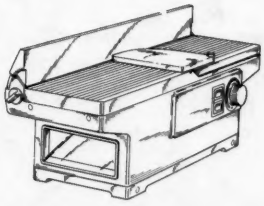
284,284
HOUSING FOR MOVABLE CURSOR CONTROL FOR A VIDEO DISPLAY
Jerrold C. Manock, Palo Alto; Terrell A. Oyama, Los Altos, and James R. Yurchenco, Palo Alto, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Oct. 13, 1983, Ser. No. 541,713
Term of patent 14 years
U.S. Cl. D14—114



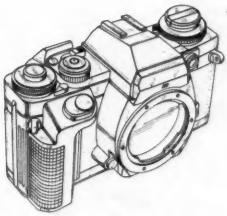
284,285
KEYBOARD
Per O. R. Lindbé, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Mar. 2, 1983, Ser. No. 471,307
Claims priority, application Sweden, Sep. 14, 1982, 82-2204
Term of patent 14 years
U.S. Cl. D14—115



284,286
PLANING MACHINE
Peter P. Pioch, Idstein, and Ulrich Reiferscheid, Bad Camberg, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.
Filed Aug. 2, 1984, Ser. No. 636,971
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, URA 124/84
Term of patent 14 years
U.S. Cl. D15—127



284,287
SINGLE LENS REFLEX CAMERA
Takaharu Kato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Dec. 23, 1983, Ser. No. 564,760
Claims priority, application Japan, Jun. 24, 1983, 58-027346
Term of patent 14 years
U.S. Cl. D16—8

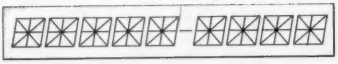


284,288
PRINTING CALCULATOR
Noriko Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 19, 1984, Ser. No. 601,993
Claims priority, application Japan, Oct. 20, 1983, 58-45834
Term of patent 14 years
U.S. Cl. D18—7

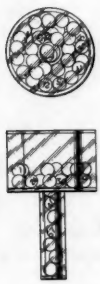
284,289
FAN-FOLD PAPER CATCHER
Roland R. Cavanagh, Woodside, Calif., assignor to Kings Mountain Computer Products, Woodside, Calif.
Filed Oct. 3, 1983, Ser. No. 538,161
Term of patent 14 years
U.S. Cl. D18—22

284,290
COMBINED WRITING PEN AND CIGARETTE LIGHTER
John Concilio, 4040 Jean East, Montreal-North, Quebec, Canada H1H 1G6, and Vincent Torres, Montreal, Canada, assignors to John Concilio, Quebec, Canada
Filed Nov. 14, 1983, Ser. No. 551,464
Term of patent 14 years
U.S. Cl. D19—36

284,291
CODING LABEL
Randolph S. Levine, 4801 Woodway, Ste. 300E, Houston, Tex. 77056
Filed May 8, 1981, Ser. No. 262,022
Term of patent 14 years
U.S. Cl. D20—27

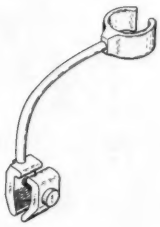


284,292
BALL GAME TUMBLER
Frank S. Smirne, 1240 Washington St., Whitehall, Pa. 18052
Filed Sep. 20, 1983, Ser. No. 534,111
Term of patent 14 years
U.S. Cl. D21—39

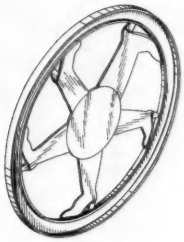


284,293
ACTIVITY TOY
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Surrey, England
Filed Feb. 1, 1984, Ser. No. 575,851
Claims priority, application United Kingdom, Nov. 9, 1983, 1016178
Term of patent 14 years
U.S. Cl. D21—59

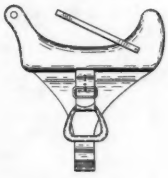
284,294
BABY BOTTLE OR TOY HOLDER
Gene Upton, Mission Viejo, Calif., assignor to Reach High Products, Inc., San Diego, Calif.
Filed Apr. 4, 1984, Ser. No. 596,640
Term of patent 14 years
U.S. Cl. D21—63



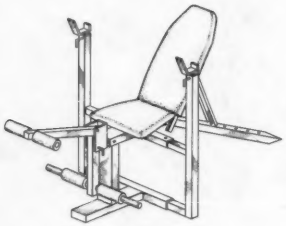
284,295
DECORATIVE WHEEL
Thayard A. McGuire, 11713 Winn Rd., Riverview, Fla. 33569
Continuation-in-part of Ser. No. 430,028, Sep. 30, 1982. This application Apr. 25, 1983, Ser. No. 488,364
Term of patent 14 years
U.S. Cl. D21—101



284,296
TOY SADDLE
Joseph J. Bossert, and Cassandra K. Bossert, both of 2204 N.W. Norman, Gresham, Oreg. 97030
Filed Dec. 19, 1983, Ser. No. 562,835
Term of patent 14 years
U.S. Cl. D21—109



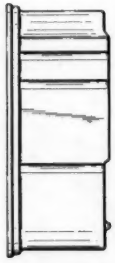
284,297
EXERCISE BENCH
Parker E. Mahnke, Studio City, Calif., assignor to Marcy Gymnasium Equipment Co., Alhambra, Calif.
Filed May 4, 1984, Ser. No. 607,003
Term of patent 14 years
U.S. Cl. D21—195



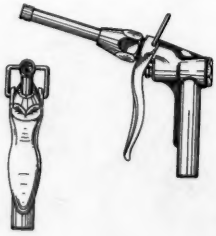
284,298
GOLF CLUB GRIP
Masashi Kobayashi, Matsudo, Japan, assignor to Naruman Golf Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 4, 1983, Ser. No. 520,252
Claims priority, application Japan, Feb. 4, 1983, 58-4215
Term of patent 14 years
U.S. Cl. D21—222

284,299
FISHING LEADER HOLDER
Frederick F. Auerbach, 2660 E. Parley's Way, Salt Lake City, Utah 84109, and Arlin D. Nelson, 3 Cherrywoods, Sandy, Utah 84070
Filed Mar. 8, 1984, Ser. No. 587,519
Term of patent 14 years
U.S. Cl. D22—25

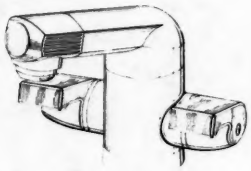
284,300
FILTER CARTRIDGE
David Hodgkins, Manchester, Conn., assignor to Stanadyne, Inc., Windsor, Conn.
Filed Jun. 24, 1983, Ser. No. 507,800
Term of patent 14 years
U.S. Cl. D23—4



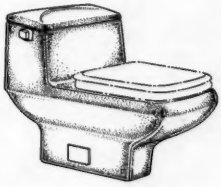
284,301
SPRAY GUN
Robert W. Hengesbach, 7886 Mentor Rd., Mentor, Ohio 44060
Division of Ser. No. 461,874, Jan. 28, 1983. This application Jul. 18, 1985, Ser. No. 756,186
Term of patent 14 years
U.S. Cl. D23—17



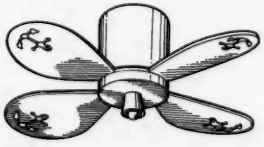
284,302
FAUCET
Gösta Hammarstedt, Alstermo, Sweden, assignor to Arcu Armaturindustri AB, Alstermo, Sweden
Filed Mar. 13, 1984, Ser. No. 589,014
Term of patent 14 years
U.S. Cl. D23—25



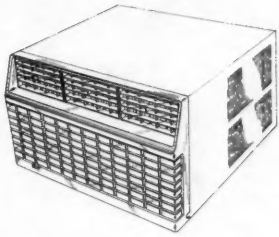
284,303
TOILET
Roger Yvetot, Conflans-Sainte-Honorine, France, assignor to Societe Generale de Fonderie, Paris, France
Filed Sep. 21, 1983, Ser. No. 534,356
Claims priority, application France, Mar. 21, 1983, 831071
Term of patent 14 years
U.S. Cl. D23—65



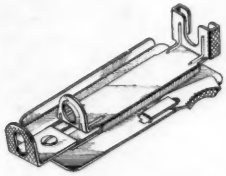
284,304
COMBINED CEILING FAN AND LIGHT
Eva L. Harber, 2428 Taylor Ave., Alexandria, Va. 22302
Filed Oct. 11, 1984, Ser. No. 659,961
Term of patent 14 years
U.S. Cl. D23—155



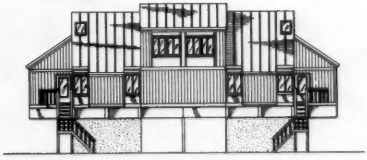
284,305
ROOM AIR CONDITIONER GRILL
David M. Lapychak, San Antonio, Tex.; James D. Alsup, Jr., Decatur, Ga.; William J. Saunders, San Antonio, Tex., and Robert D. Bruffey, Jr., Decatur, Ga., assignors to Friedrich Air Conditioning & Refrigeration Co., San Antonio, Tex.
Filed Dec. 16, 1983, Ser. No. 562,101
Term of patent 14 years
U.S. Cl. D23—163



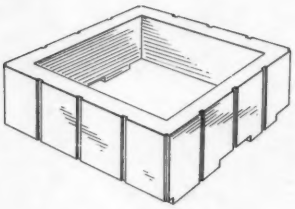
284,306
INSULIN SYRINGE INJECTOR
Paul C. Moore, Jr., Matoaca, Va., assignor to John A. Long, Petersburg, Va., a part interest
Filed Oct. 3, 1983, Ser. No. 538,402
Term of patent 14 years
U.S. Cl. D24—25



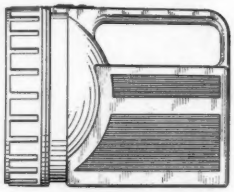
284,307
TWO STORY PEDESTAL DUPLEX
Bertram Zusman, 4112 Monticello Blvd., Youngstown, Ohio 44505
Filed Jul. 29, 1983, Ser. No. 518,457
Term of patent 14 years
U.S. Cl. D25—17



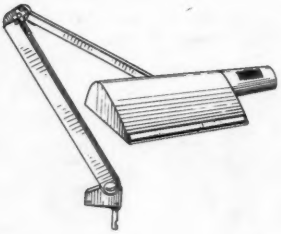
284,308
MODULE FOR WALLS AND FREE STANDING STRUCTURES
Angelo Risi, and Antonio Risi, both of P.O. Box 370, Gormley, Ontario, Canada L0H 1G0
Filed May 24, 1983, Ser. No. 497,740
Term of patent 14 years
U.S. Cl. D25—91



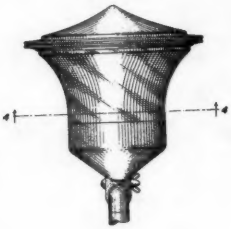
284,309
FLOATING LANTERN
John F. Schosser, New Fairfield; Roger F. Gleason, Stratford, both of Conn.; Charles M. Dole, Purdys, N.Y.; Richard F. Galya, Stratford, Conn., and Peter A. Gebhardt, Katonah, N.Y., assignors to Duracell Inc., Bethel, Conn.
Filed Feb. 22, 1983, Ser. No. 468,260
Term of patent 14 years
U.S. Cl. D26—48



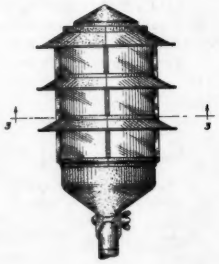
284,310
LAMP FOR A WORK STATION
Irving Schaffer, Fairfield, and Willfred Goldschmidt, Weston, both of Conn., assignors to Ledu Corporation, Trumbull, Conn.
Filed Oct. 17, 1983, Ser. No. 542,411
Term of patent 14 years
U.S. Cl. D26—65



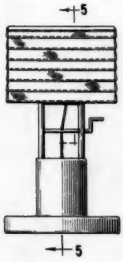
284,311
OUTDOOR LIGHT
Madhu Patel, Skokie, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Division of Ser. No. 371,714, Apr. 26, 1982 Pat. No. Des.277,511. This application Oct. 11, 1984, Ser. No. 659,775
Term of patent 14 years
U.S. Cl. D26—67



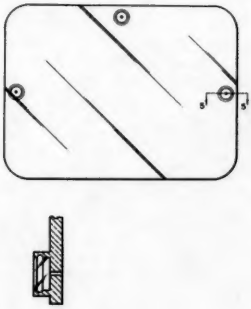
284,312
OUTDOOR LIGHT
Madhu Patel, Skokie, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Division of Ser. No. 371,714, Apr. 26, 1982, Pat. No. Des. 277,511. This application Oct. 11, 1984, Ser. No. 659,780
Term of patent 14 years
U.S. Cl. D26—67



284,313
LAMP
Michael Sidney, 1309 W. 112th St., Chicago, Cook County, Ill. 60643
Filed Apr. 18, 1983, Ser. No. 486,017
Term of patent 14 years
U.S. Cl. D26—94



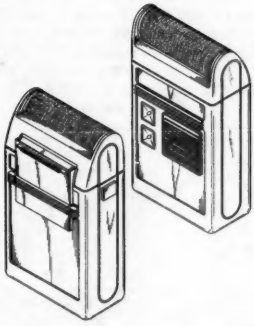
284,314
HEADLIGHT PROTECTIVE LENS
Walter R. Gavlik, 4126 S. 88th East Ave., Tulsa, Okla. 74145
Filed Jun. 22, 1983, Ser. No. 506,626
Term of patent 14 years
U.S. Cl. D26—139



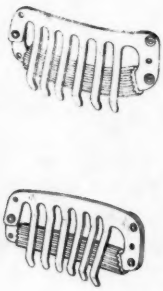
284,315
COMB BACK
Robert B. Pribble, 888 S. Fair Oaks, Pasadena, Calif. 91105
Filed Apr. 25, 1983, Ser. No. 488,156
Term of patent 14 years
U.S. Cl. D28—34

284,316
TRAVEL CAP FOR A RAZOR
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Wilkinson Sword Limited, High Wycombe, England
Filed Jun. 1, 1984, Ser. No. 616,443
Claims priority, application United Kingdom, Dec. 2, 1983, 1016665
Term of patent 14 years
U.S. Cl. D28—44

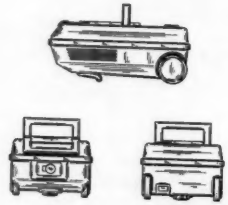
284,317
ELECTRIC SHAVER
Shunji Izumi, Matsumoto, Japan, assignor to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan
Filed Jun. 14, 1984, Ser. No. 620,574
Claims priority, application Japan, Mar. 29, 1984, 59-12401
Term of patent 14 years
U.S. Cl. D28—49



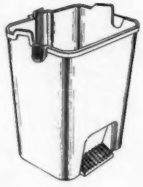
284,318
WIG ANCHOR
Nobuo Nemoto, Tokyo, Japan, assignor to Aderans Company, Ltd., Japan
Filed Apr. 5, 1984, Ser. No. 596,855
Term of patent 14 years
U.S. Cl. D28—93



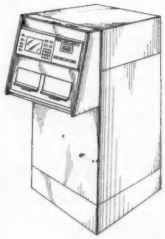
284,319
VACUUM CLEANER
Sachio Yamamoto, and Akira Tsukada, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 27, 1983, Ser. No. 546,089
Claims priority, application Japan, Apr. 28, 1983, 58-18471
Term of patent 14 years
U.S. Cl. D32—21



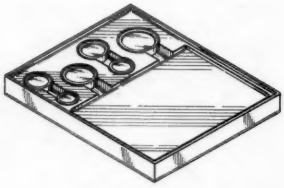
284,320
CONTAINER FOR A PEDAL BIN
Nick Kubic, Dollard des Ormeaux; Claude Bell, Boucherville, and Serge Seguin, Fabreville, all of Canada, assignors to Produits Menagers Culinaires (Baie d'Urfe) Inc., Quebec, Canada
Filed Jul. 21, 1983, Ser. No. 515,963
Claims priority, application Canada, Feb. 17, 1983, 17-02-83-3
Term of patent 14 years
U.S. Cl. D34—1



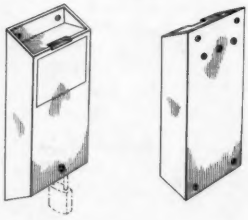
284,321
AUTOMATIC TELLER MACHINE
Yutaka Kobayashi, Hirakata, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Nov. 1, 1983, Ser. No. 547,650
Term of patent 14 years
U.S. Cl. D99—28



284,322
COIN PACKAGE
Fred J. Povitz, c/o Corporation Universel d'Emballage/Universal Package Corporation, 240 Bates Rd., Mount Royal, Quebec, Canada H36 1A3
Filed Nov. 21, 1983, Ser. No. 553,985
Claims priority, application Canada, Sep. 21, 1983, 21-09-83-2
Term of patent 14 years
U.S. Cl. D99—34



284,323
HONOR SYSTEM COIN BOX FOR COFFEE MACHINE
Cecil W. Whatley, 1501 C Ave., Lawton, Okla. 73501
Filed Dec. 2, 1983, Ser. No. 557,490
Term of patent 14 years
U.S. Cl. D99—28



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JUNE, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Manforts GmbH & Co.: *See—*
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,594,796, Cl. 34-82.000.

A/S Niro Atomizer: *See—*
Andreasen, Jens; Donnelly, James R.; Felsvang, Karsten S.; Jons, Ebbe S.; and Veltman, Preston L., 4,595,576, Cl. 423-242.000.

A. W. Faber-Castell GmbH & Co.: *See—*
Schiefnetter, Harald; Meyer, Richard; and Rosbiegalle, Rudolf, 4,595,308, Cl. 401-243.000.

Aario, Matti, to Oy Tampella AB. Blocking slab for pulp grinder. 4,595,150, Cl. 241-282.000.

AB Kelva: *See—*
Warfvinge, Kjell, 4,594,748, Cl. 15-308.000.

Abadi, Khodabandeh. Composition for removing scale from a surface comprising alpha-hydroxy carboxylic acid and thickener. 4,595,517, Cl. 252-82.000.

Abe, Yuya; and Sawa, Toshio, to Nippo Sangyo Co. Ltd. Dynamic friction coefficient measuring apparatus. 4,594,878, Cl. 73-9.000.

Abel, Donald, to Morton Glass Works. Device for fracturing glass along a scoreline. 4,595,132, Cl. 225-103.000.

Abergel, Reuven A. Light-tight combination micrographic map-reader protractor compass. 4,594,788, Cl. 33-275.00R.

Abplanalp, George. Ointment applicator. 4,595,391, Cl. 604-308.000.

Abrevaya, Hayim: *See—*
Imai, Tamotsu; and Abrevaya, Hayim, 4,595,673, Cl. 502-227.000.

Abuyama, Yasuo; and Sogo, Toshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Paper feeder apparatus. 4,595,189, Cl. 271-9.000.

Ackermann, Denis, to Mosimann, David. Handle. 4,595,362, Cl. 433-129.000.

Adolph Coors Company: *See—*
Hahn, Roger A., 4,595,552, Cl. 264-328.100.
Thompson, Roger A.; McCullough, Davey L.; Dugan, Larry M.; and Branch, Lewis R., 4,595,331, Cl. 414-347.000.

Adret Electronique: *See—*
Charbonnier, Roger; Remy, Joel; and Sauvage, Gerard, 4,595,893, Cl. 333-246.000.

Advanced Chemical Technologies Company: *See—*
Brown, Roy N.; Stout, Mike F.; Hagen, Arnulf P.; and Garwin, Leo, 4,595,599, Cl. 427-5.000.

Agency of Industrial Science and Technology: *See—*
Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, 4,595,701, Cl. 518-701.000.

Agrawal, Rakesh; and Auvil, Steven R., to Air Products and Chemicals, Inc. Process for the generation of gaseous and/or liquid nitrogen. 4,595,405, Cl. 62-18.000.

Air Monitor Corporation: *See—*
DeBaun, Kenneth W.; and Morris, Robert H., 4,594,888, Cl. 73-198.000.

Air Products and Chemicals, Inc.: *See—*
Agrawal, Rakesh; and Auvil, Steven R., 4,595,405, Cl. 62-18.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Amano, Hiroyuki; and Oda, Yukihisa, 4,595,897, Cl. 335-205.000.

Aisin-Warner Limited: *See—*
Kubo, Seitoku; Morisawa, Kunio; and Miura, Masakatsu, 4,594,914, Cl. 74-730.000.

Ajinomoto Co., Inc.: *See—*
Kimura, Yasuhiro; and Niki, Katsumi, 4,595,479, Cl. 204-294.000.

Ajiro, Shuichi: *See—*
Wada, Masami; and Ajiro, Shuichi, 4,595,065, Cl. 175-85.000.

Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, to Toyota Jidosha Kabushiki Kaisha. Transmission with two parallel driving shafts bearing two driving gears each meshed with same driven gear on parallel driven shaft. 4,594,908, Cl. 74-359.000.

Akers, Roy A.: *See—*
Wiley, David; and Akers, Roy A., 4,595,188, Cl. 271-4.000.

Akins, Dorman C. Spacer. 4,594,832, Cl. 52-715.000.

Akiyoshi, Mitsuo: *See—*
Hirai, Kazumi; Akiyoshi, Mitsuo; Nakano, Chikao; Watanabe, Kenji; and Kodama, Satoru, 4,595,827, Cl. 219-518.000.

Aktiebolaget Iro: *See—*
Tholander, Lars H. G., 4,595,039, Cl. 139-435.000.

Aktiengesellschaft Adolph Saurer: *See—*
Comploi, Georg; Loacker, Arthur; Huber, Kurt; Hutter, Wilhelm; and Wallimann, Hans, 4,594,952, Cl. 112-84.000.

Akzo NV: *See—*
Schindler, Erich; and Maier, Franz, 4,595,503, Cl. 210-500.380.

Albertelli, Aldino; Hohmann, Lothar M.; and Curtis, Anthony N., to Company "A" (Foam) Limited. Foamed plastics materials. 4,595,710, Cl. 521-100.000.

Alexandris, George, to General Dynamics, Pomona Division. Thermal protection for propellant grains. 4,594,945, Cl. 102-287.000.

Alfa-Laval AB: *See—*
Jonsson, Nils A.; and Mossberg, Bengt, 4,595,208, Cl. 277-206.00R.

Algieri, Aldo A.: *See—*
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,595,758, Cl. 546-212.000.

Allen, Christopher M.; and Hinckliefff, Ian R., to USM Corporation. Fluorocarbon polymer compositions. 4,595,718, Cl. 523-434.000.

Allen, Jefferson K. Composition for cleaning and clearing plastic surfaces. 4,595,719, Cl. 523-500.000.

Allen, Ronald; and Chen, Tu, to Komag, Inc. Disk carrier. 4,595,481, Cl. 204-298.000.

Allen, Stephen D.; and Thompson, Michael, to Becton Dickinson & Company. Coupling agents and products produced therefrom. 4,595,656, Cl. 435-7.000.

Alles, Harold G., to AT&T Bell Laboratories. Sort circuit and method using multiple parallel sorts of the sorted items. 4,595,995, Cl. 364-900.000.

Allied Corporation: *See—*
Ferguson, Susan A.; and Chin, Roland L., 4,595,649, Cl. 430-296.000.
Gaiser, Robert F., 4,595,243, Cl. 303-6.00C.
Krob, Dennis J.; Cieniawa, Edward; and Liburdi, Francesio, 4,595,799, Cl. 179-98.000.
Schmidt, John C.; Campbell, Donald N.; and Clay, Sandra B., 4,595,486, Cl. 204-412.000.

Allied Products Corporation: *See—*
Harden, Russell J.; and Harden, Jerrell W., 4,595,140, Cl. 239-167.000.

Allis-Chalmers Corporation: *See—*
Silletto, John L.; and Dahlem, Francis E., 4,595,402, Cl. 55-378.000.

Allred, David; Eichen, Erwin; and Flasck, James, to Energy Conversion Devices, Inc. Cross head for internal combustion engine. 4,594,973, Cl. 123-90.400.

Alps Electric Co., Ltd.: *See—*
Aoki, Kazuharu; and Saito, Masahiko, 4,596,044, Cl. 455-189.000.
Shimaoka, Motohiro, 4,595,963, Cl. 360-99.000.

Alto-Shaam, Inc.: *See—*
Zank, Jeffrey T., 4,595,247, Cl. 312-343.000.

Aluminum Company of America: *See—*
Fox, Lawrence L.; and Merrick, Nelson J., 4,595,509, Cl. 210-665.000.
Klingensmith, James D.; and Hovland, Lyle W., 4,595,165, Cl. 248-539.000.
Misra, Chanakya; and Sivakumar, Thinnalur J., 4,595,581, Cl. 423-625.000.

Alwerud, S. Tomas. Apparatus and method for dispensing a predetermined weight per unit of time of nonfree-flowing particulate material. 4,595,125, Cl. 222-55.000.

ALZA Corporation: *See—*
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,595,583, Cl. 424-15.000.

Amano, Hiroyuki; and Oda, Yukihisa, to Aisin Seiki Kabushiki Kaisha. Speed sensor device. 4,595,897, Cl. 335-205.000.

Amano, Masahiro: *See—*
Nishiyama, Ryota; Amano, Masahiro; Seino, Shunji; Gamou, Yutaka; and Kawakami, Hidenori, 4,595,457, Cl. 162-123.000.

Amarakoon, Kiri B., to Xerox Corporation. Bottom sheet separator-feeder. 4,595,190, Cl. 271-94.000.

American Can Company: *See—*
Eckstein, John P.; Gillespie, William S.; and Schaefer, Suzanne E., 4,595,434, Cl. 156-69.000.

American Cyanamid Company: *See—*
Nagaraj, D. R., 4,595,493, Cl. 209-166.000.

American Hoescht Corporation: *See—*
Kelly, Michael G.; and Steckelberg, Willi R., 4,595,628, Cl. 428-265.000.

American Home Products Corporation: *See—*
Schiehser, Guy A.; Nielsen, Susan T.; and Strike, Donald P., 4,595,757, Cl. 546-197.000.

American Hospital Supply Corporation: *See—*
Liston, Max D.; and Hsei, Paul K., 4,595,562, Cl. 422-65.000.
Mayhan, Kenneth G.; Janssen, Robert A.; and Drake, Roger F., 4,595,632, Cl. 428-409.000.
Webler, William E.; and Lieber, Clement, 4,595,012, Cl. 128-642.000.

American Medical Systems, Inc.: *See—*
Porter, Christopher H.; Giter, Gregory D.; and Pugh, Robert W., Jr., 4,594,998, Cl. 128-79.000.

American Solar King Corporation: *See—*
Coellner, James A.; MacIntosh, David S.; and Blanpied, Mark C., 4,594,860, Cl. 62-271.000.
American Welding & Manufacturing Co.: *See—*
Winyard, Rodney W., 4,594,831, Cl. 52-395.000.
Amiet, Louis; and Disdier, Camille, to Rhone Poulenc Specialties Chimiques. Process for the preparation of trifluoroacetic anhydride. 4,595,541, Cl. 260-546.000.
Amodeo, Ralph J.; and Krohn, William, to Perkin-Elmer Corporation, The. Apparatus for detecting coherent radiation and unequal path interferometers. 4,595,292, Cl. 356-346.000.
AMP Incorporated: *See—*
Koblitz, Francis F., 4,595,724, Cl. 524-409.000.
Ampex Corporation: *See—*
Louth, Kenneth, 4,595,868, Cl. 318-608.000.
Anapliotis, Emmanuel; and Kranz, Curt, to Mecron Medizinische Produkte GmbH. Hip joint prosthesis having a hollow shaft. 4,595,393, Cl. 623-22.000.
Andersen, Jorgen S., to Maskinfabriken Cidan A/S. Sheet bending machine. 4,594,867, Cl. 72-7.000.
Anderson, Edward M. Food cooking machine with control mechanism. 4,594,941, Cl. 99-334.000.
Anderson, Frode. Capstan winch, particularly for sailing boats. 4,595,173, Cl. 254-342.000.
Anderson, James D., to Burndy Corporation. Connector installation station for compact semi-automatic cable assembly system. 4,594,776, Cl. 29-749.000.
Anderson, Karen L.: *See—*
Mitchell, Joan L.; and Anderson, Karen L., 4,596,039, Cl. 382-56.000.
Anderson, Ronald D. Drag attachment for a disk. 4,595,064, Cl. 172-178.000.
Anderson, Walter F., Jr.; Sabo, Brian D.; Poulo, Louis R.; Wissmuller, Jan; and Fantuzzi, Joseph D., to Minnesota Mining and Manufacturing Company. Multiformat image recordation. 4,595,958, Cl. 358-296.000.
Andersson, Alf O. Pulp washing process. 4,595,456, Cl. 162-47.000.
Andersson, Roger; Engdahl, Lennart; and Klasson, Jan, to Stiga AB. Lawn mower knife assembly. 4,594,843, Cl. 56-295.000.
Ando, Hideo; Kawaguchi, Hideo; and Watanabe, Yasuhiko, to Brother Kogyo Kabushiki Kaisha. Button sewing machine. 4,594,953, Cl. 112-112.000.
Andreasen, Jens; Donnelly, James R.; Felsvang, Karsten S.; Jons, Ebbe S.; and Veltman, Preston L., to A/S Niro Atomizer. Process for flue gas desulfurization. 4,595,576, Cl. 423-242.000.
Ang, Peter G. P.; Sammells, Anthony F.; and Morduchowitz, Abraham, to Texaco Inc. Means and method for reducing carbn dioxide to provide an oxalate product. 4,595,465, Cl. 204-59.00R.
Anorad Corporation: *See—*
Chitayat, Anwar, 4,595,870, Cl. 318-687.000.
Anthony, Thomas R.; Houston, Douglas E.; and Loughran, James A., to General Electric Company. Method for producing high-aspect ratio hollow diffused regions in a semiconductor body. 4,595,428, Cl. 148-187.000.
Antipov, Igor, to International Business Machines Corporation. Resistor structure for transistor having polysilicon base contacts. 4,595,944, Cl. 357-51.000.
Antonuzzi, Anthony P.; and Carignan, Donald J., to United States of America, Air Force. Electromechanical switch. 4,595,808, Cl. 200-37.00R.
Aoki, Eiji: *See—*
Watanabe, Hiroshi; and Aoki, Eiji, 4,596,047, Cl. 455-281.000.
Aoki, Kazuharu; and Saito, Masahiko, to Alps Electric Co., Ltd. UHF-VHF combination tuner. 4,596,044, Cl. 455-189.000.
Aoki, Yuji: *See—*
Shimizu, Etsuo; Aoki, Yuji; Suzuki, Yujiro; and Miura, Norio, 4,595,639, Cl. 428-690.000.
Aoyagi, Takaaki: *See—*
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Straub, Ferdinand; Aydin, Oral; Linke, Wolfgang; Schroeder, Gerd; and Fickeisen, Peter, 4,595,737, Cl. 526-264.000.
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Hombach, Rudolf; Dollhausen, Manfred; Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Reischl, Artur, 4,595,445, Cl. 156-307.300.
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Berney, Sheldon, to Reliance Products Ltd. Reversible pouring spout assembly for containers. 4,595,130, Cl. 222-539.000.
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Snyder, Fred L.; and Blank, Merle L., 4,595,681, Cl. 514-77.000.
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Coellner, James A.; MacIntosh, David S.; and Blanpied, Mark C., 4,594,860, Cl. 62-271.000.
Blaschke, Marilyn W.; Miller, Richard F.; and Link, John, to Atlantic Richfield Company. Water-soluble antimony compounds and their preparation. 4,595,771, Cl. 556-77.000.
Blaschke, Marilyn W.; Miller, Richard F.; and Link, John, to Atlantic Richfield Company. Novel water-soluble antimony compounds and their preparation. 4,595,772, Cl. 556-77.000.
Blayne, Jerome J.; Sidles, James; and Bartley, Donald R., to B. F. Goodrich Company, The. Method for ventless tire molding. 4,595,553, Cl. 264-501.000.
Blechman, Abraham; and Pescatore, Eugene A., to Medical Magnetics, Inc. Magnetic force orthodontic kit and appliances constructed therefrom. 4,595,361, Cl. 433-18.000.
Blondel, Philippe; and Jungblut, Camille, to Atochem. Grafted polymer from unsaturated polyamide having single olefinic double bond. 4,595,730, Cl. 525-178.000.
Bloom, Aaron: *See*—
Shoemaker, Charles J.; Scavnicky, John A.; Little, Malcolm E.; Hagy, Emily M.; and Bloom, Aaron, 4,595,003, Cl. 128-201.190.
Board of Regents, The University of Texas System: *See*—
Baron, Samuel; and McKerlie, M. Louese, 4,595,588, Cl. 424-89.000.
Bober, Henry T., to Xerox Corporation. Saddle stapler accessory. 4,595,187, Cl. 270-37.000.
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; by Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I. Method of mechanical machining of workpieces using a plasma arc to heat the cutting zone. 4,595,817, Cl. 219-121.0PY.
Boeck, Oldemar: *See*—
D'Almeida, Werner K.; and Boeck, Oldemar, 4,594,840, Cl. 56-11.200.
Boehringer Ingelheim KG: *See*—
Zierenberg, Bernd; and Gupte, Arun R., 4,595,587, Cl. 424-81.000.
Boeing Company, The: *See*—
Carcas, Norman J., 4,594,750, Cl. 16-229.000.
Robinson, Curtiss W., 4,595,158, Cl. 244-75.00R.
Boeke, Jef D.: *See*—
Zinder, Norman D.; Model, Peter; and Boeke, Jef D., 4,595,658, Cl. 435-68.000.
Bogdany, John, to GenCorp Inc. Carpet tiles having a filled flexible frothed vinyl polymer backing and their method of manufacture. 4,595,617, Cl. 428-95.000.
Boger, David L.; Johnson, Leighton C.; and Pugh, Jerry T., to Miles Laboratories, Inc. Process of forming a multiple profile reagent card. 4,595,439, Cl. 156-178.000.
Bohannon, William D., Jr.; Hamilton, Alfred S.; and West, Danny E., to AT&T Technologies, Inc. Methods of and apparatus for applying a waterproofing material to a cable core wrap. 4,595,431, Cl. 156-54.000.
Bohm, Janos: *See*—
Bohm, Nandor; Bohm, Janos; and Bohm, Robert, 4,595,184, Cl. 267-156.000.
Bohm, Nandor; Bohm, Janos; and Bohm, Robert, to Kozuti Kozlekedesi Tudomanyos Kutato Intezet. Controllable spiral spring, in particular with logarithmic characteristics. 4,595,184, Cl. 267-156.000.

Bohm, Robert: *See*—
Bohm, Nandor; Bohm, Janos; and Bohm, Robert, 4,595,184, Cl. 267-156.000.
Bolenz & Schafer Maschinenfabrik Zweigniederlassung der Rexnard GmbH: *See*—
Wege, Manfred, 4,595,038, Cl. 138-31.000.
Boller, Kurt: *See*—
Berner, Willy; Berger, Hans; and Boller, Kurt, 4,595,320, Cl. 408-182.000.
Bondi, Joseph V.; and Grabowski, Lucille A., to Merck & Co., Inc. Diffusion measuring device. 4,594,884, Cl. 73-64.300.
Bonnet, Kenneth. Apparatus and method for detecting body vibrations. 4,595,023, Cl. 128-782.000.
Bononi, Fred A.; and Weis, Armand J., deceased (by Weis, Delma G., legal representative), to Veeder Industries Inc. Method of forming socket wrenches from tubing. 4,594,874, Cl. 72-356.000.
Boris, Alfred; Guthrie, Robert W.; and Kierstead, Richard W., to Hoffmann-LaRoche Inc. 4-(8-bromodibenz[b,f]oxepin-10-yl)-1,2,3,6-tetrahydro-1-methylpyridine and 4-(2-bromodibenzo[a,d]cyclophetatriene-11-yl)-1,2,3,6-tetrahydro-1-methylpyridine for dermal inflammation. 4,595,689, Cl. 514-337.000.
Boris, Alfred: *See*—
Baggiolini, Enrico G.; Batcho, Andrew D.; Boris, Alfred; and Uskokovic, Milan R., 4,595,776, Cl. 556-436.000.
Borst, Gaylord M., to Outboard Marine Corporation. Variable fuel/oil ratio pump for two-stroke internal combustion engine. 4,594,971, Cl. 123-73.0AD.
Borst, Gaylord M.: *See*—
Baars, William W.; Borst, Gaylord M.; and Mahoney, J. Michael, 4,594,970, Cl. 123-73.0AD.
Bosnyak, Robert J.: *See*—
Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,595,875, Cl. 324-73.0PC.
Bothe, Lothar: *See*—
Crass, Gunther; Bothe, Lothar; Janocha, Siegfried; and Dietz, Wolfgang, 4,595,625, Cl. 428-215.000.
Bouchard, Donald R.; Danton, John L.; Dawson, Kevin A.; and Sloma, David J., to International Business Machines Corporation. Video measuring system for defining location orthogonally. 4,596,037, Cl. 382-8.000.
Boulin, Yves; Cesario, Jean; and Landeau, Bernard, to Commissariat a l'Energie Atomique. Material ionizing device. 4,595,835, Cl. 250-423.00R.
Bowsky, Benjamin, to Emerson Electric Co. Method of increasing hermeticity of metal components of glass/metal and ceramic/metal seals. 4,595,557, Cl. 419-49.000.
Boyadjieff, George I.; and Campbell, Andrew B., to Varco International, Inc. Well casing jack mechanism. 4,595,062, Cl. 166-379.000.
Boyer, Keith: *See*—
Fenstermacher, Charles A.; and Boyer, Keith, 4,596,017, Cl. 372-74.000.
Boyle, James A.: *See*—
Ficken, Leonard A.; Podgorny, Gerald J.; and Boyle, James A., 4,594,838, Cl. 53-471.000.
Bozoyan, Edward. Waterless urinal pumps. 4,595,346, Cl. 417-513.000.
BP Chemicals Limited: *See*—
Tenhagen, Rudolf J., 4,595,565, Cl. 422-133.000.
BP Photovoltaics, Ltd.: *See*—
Basol, Bulent M., 4,595,790, Cl. 136-256.000.
Bradshaw, Gale T., to Standard Oil Company (Indiana). NMR measurement on frozen cores. 4,595,878, Cl. 324-300.000.
Brake, Loren D., to Du Pont de Nemours, E. I., and Company. Preparation of dimethyl ether by catalytic dehydration of methanol. 4,595,785, Cl. 568-698.000.
Branch, Lewis R.: *See*—
Thompson, Roger A.; McCullough, Davey L.; Dugan, Larry M.; and Branch, Lewis R., 4,595,331, Cl. 414-347.000.
Brandstetter, Robert W., to Warner & Swasey Company, The. Bridge type coordinate measuring machine. 4,594,791, Cl. 33-503.000.
Brannan, James R., to Eltech Systems Corporation. Cathode for electrolysis cell. 4,595,468, Cl. 204-98.000.
Braren, Rudolf. Cycloid transmission assembly. 4,594,915, Cl. 74-805.000.
Brass, Jack L.: *See*—
Duran, Reginald F.; and Brass, Jack L., 4,595,826, Cl. 219-400.000.
Brassat, Bert: *See*—
Hess, Bernhard; Brassat, Bert; and Peltzer, Bernhard, 4,595,725, Cl. 525-33.000.
Braun, Steven W.; and Hodara, Henri, to Tetra-Tech, Inc. Bidirectional optical electronic converting connector with integral preamplification. 4,595,839, Cl. 250-551.000.
Brennan, James A.: *See*—
Chu, Yung F.; Brennan, James A.; and Chester, Arthur W., 4,595,702, Cl. 518-713.000.
Breslow, Jeffrey D.: *See*—
Rasmussen, Russell G.; Hanson, Steven P.; and Breslow, Jeffrey D., 4,595,379, Cl. 446-341.000.
Bresson, Clarence R.: *See*—
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., 4,595,538, Cl. 260-502.560.
Bridenbaugh, John C.; and Love, Robert W., to United States of America, Air Force. Deception pattern for camouflage. 4,595,156, Cl. 244-1.00R.
Bridgestone Corporation: *See*—
Nishio, Hideaki; and Shimizu, Nobuo, 4,595,042, Cl. 152-209.00B.
Bridgestone Tire Company Limited: *See*—
Dan, Takuya; Kojima, Hiroshi; and Orikawa, Michihiro, 4,595,183, Cl. 267-140.100.
Sorioka, Michitoshi, 4,595,448, Cl. 156-396.000.
Briggs, Willard S., to Mostek Corporation. Non-overlapping clock CMOS circuit with two threshold voltages. 4,595,845, Cl. 307-443.000.
Briley, Patrick B. Ejector and method of controlling same. 4,595,344, Cl. 417-185.000.
Brisson, Glen: *See*—
Shene, William R.; and Brisson, Glen, 4,595,019, Cl. 128-734.000.
Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,595,758, Cl. 546-212.000.
British Aerospace Public Limited Company: *See*—
Geen, John A., 4,595,293, Cl. 356-350.000.
Hodgins, Diana M.; and Homewood, George J. R., 4,594,862, Cl. 62-417.000.
British Hydromechanics Research Assoc., The: *See*—
Pollard, Geoffrey J., 4,594,883, Cl. 73-54.000.
British Telecommunications: *See*—
Sinnadurai, F. Nihal; Cook, Anthony J.; and Gurnett, Keith W., 4,595,096, Cl. 206-331.000.
Broadbent, David J., to S. C. Johnson & Son, Inc. Insecticidal compositions utilizing 2-pyrrolidones having enhanced insect knockdown characteristics. 4,595,679, Cl. 514-67.000.
Broan Mfg. Co., Inc.: *See*—
Wolbrink, David W.; and Otte, Dieter W., 4,594,940, Cl. 98-42.100.
Brocklehurst, Charles E., to Opelika Manufacturing Corporation. Towel aligning, cutting and hemming system. 4,595,133, Cl. 226-34.000.
Brodasky, Thomas F.; and Stroman, David W., to Upjohn Company, The. Antibiotic compound and process for recovery thereof from a fermentation broth. 4,595,770, Cl. 549-541.000.
Brodbeck, Robert M., to Marcamor, Inc. Telephone number input terminal devices. 4,595,798, Cl. 179-90.0BD.
Brooks, Ralf M.; Vyas, Arvindkumar C.; and Connell, Brian P., to NCR Canada Ltd. System for detecting defective thermal printhead elements. 4,595,935, Cl. 346-76.0PH.
Bross, Elly, to Stanbel Group, The. Interlocking spacer system. 4,595,246, Cl. 312-330.00R.
Brother Kogyo Kabushiki Kaisha: *See*—
Ando, Hideo; Kawaguchi, Hideo; and Watanabe, Yasuhiko, 4,594,953, Cl. 112-112.000.
Kuzuya, Susumu; and Imaizumi, Mamoru, 4,595,303, Cl. 400-82.000.
Brown, Ian A.: *See*—
Scopatz, Stephen D.; and Brown, Ian A., 4,595,091, Cl. 198-372.000.
Brown, James C. Terminal block. 4,595,248, Cl. 339-17.0LC.
Brown, John L. Fishing lure with fins providing a side to side motion. 4,594,806, Cl. 43-42.180.
Brown, Roy N.; Stout, Mike F.; Hagen, Arnulf P.; and Garwin, Leo, to Advanced Chemical Technologies Company. Luminescent silane. 4,595,599, Cl. 427-5.000.
Browning, Joel W.: *See*—
Cohen, Judith S.; Browning, Joel W.; and Gopffarth, Wilford H., 4,595,498, Cl. 210-192.000.
Bru-Magniez, Nicole; Teulon, Jean-Marie; and Deghenghi, Romano, to Hexachimie. Niflumic acid morpholinoethyl ester diniflumate, use as analgesic and anti-inflammatory agents and compositions. 4,595,686, Cl. 514-236.000.
Brubaker, Mary A.; Ehrhart, Wendell A.; and Whitmore, William Y., to Armstrong World Industries, Inc. Conformable tile. 4,595,626, Cl. 428-220.000.
Bruce, Thomas W.: *See*—
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., 4,594,848, Cl. 60-39.020.
Brueggemann, Harry P., to Xerox Corporation. Light collection by elliptical cylinder mirrors for raster input scanners. 4,595,947, Cl. 358-75.000.
Brummond, Robert: *See*—
Kormanik, Richard; Dejewski, Karen; and Brummond, Robert, 4,595,499, Cl. 210-202.000.
Brunelle, Daniel J., to General Electric Company. Bis-aminopyridinium salts. 4,595,760, Cl. 546-256.000.
Brunelli, Timothy A.; and Landmesser, Keith E., to GTE Products Corporation. Production of molybdenum metal. 4,595,412, Cl. 75-0.5BB.
Brunner, Josef: *See*—
Rock, Erich; and Brunner, Josef, 4,595,245, Cl. 312-330.00R.
Brunswick Corp.: *See*—
Small, Mark, 4,595,370, Cl. 440-53.000.
Bucher, Anton M., to Odetics, Inc. Method of manufacturing composite magnetic transducer. 4,594,772, Cl. 29-603.000.
Buchner, Norbert; Vogele, Gunter; and Wilke, Bernd, to Robert Bosch GmbH. Method for sterilizing packaging material and/or packaging apparatus. 4,595,560, Cl. 422-26.000.
Buckeye International, Inc.: *See*—
McClurg, Carl D., 4,595,109, Cl. 213-62.00A.
Budden, Renke: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,595,531, Cl. 260-239.0BD.
Buddy L Corporation: *See*—
Herstein, Barry S., 4,595,097, Cl. 206-335.000.

Buhlmayer, Peter: *See—*
Riniker, Bernhard; Buhlmayer, Peter; and Fuhrer, Walter, 4,595,677, Cl. 514-17.000.

Bullmerwerk G.O. Stumpf GmbH Spezialmaschinenfabrik: *See—*
Seitz, Helmut; and Henne, Herbert, 4,595,328, Cl. 414-225.000.

Bullock, Lance W.; Vlahek, Josip; and Kovacs, Ferenc, to W. R. Grace Australia Limited. Process for thermoforming thermoplastic sheet materials. 4,595,554, Cl. 264-522.000.

Bunka Shutter Co., Ltd.: *See—*
Nozawa, Nobuaki; and Kondo, Koichi, 4,595,043, Cl. 160-36.000.

Buren, Lawrence L.; and Baker, Don R., to Stauffer Chemical Co. Method of increasing the yield of plants utilizing N-(2'-diethylaminoethyl)alkylamides. 4,595,411, Cl. 71-118.000.

Burke, Dennis W.; and Harris, William H. Apparatus for cemented implantation of prostheses. 4,595,006, Cl. 128-303.00R.

Burndy Corporation: *See—*
Anderson, James D., 4,594,776, Cl. 29-749.000.

Burns, Ronald E. Low parallax error radiation detector. 4,595,834, Cl. 250-374.000.

Burroughs Corporation: *See—*
Holz, George E.; and Ogle, James A., 4,595,919, Cl. 340-793.000.
Lethellier, Patrice R., 4,595,974, Cl. 363-21.000.

Burrows, Bruce D. Purified water reverse osmosis reservoir. 4,595,497, Cl. 210-110.000.

Burt, Frank N. Expert system and method for making decisions in accordance with the decisions of a mentor. 4,595,982, Cl. 364-300.000.

Butash, John D. Football helmet face mask. 4,594,737, Cl. 2-424.000.

Butlers Ltd.: *See—*
Guggiari, Roy S., 4,595,163, Cl. 248-229.000.

Butt, Sheldon H., to Olin Corporation. Method of making semiconductor casing. 4,594,770, Cl. 29-588.000.

Buttgereit, Klaus, to Plettac GmbH, Stahlbau und Gesenkschmiede. Scaffold. 4,595,077, Cl. 182-179.000.

B.V. Machinefabriek BOA: *See—*
Denneboom, Else M., 4,594,942, Cl. 100-137.000.

Byrd, Audis C.; Morris, Robert J.; Black, Robert H.; and Weaver, Jimmie D., Jr., to Halliburton Company. Continuous reactor design. 4,595,566, Cl. 422-134.000.

C-R-O, Inc.: *See—*
Nelson, James A.; and Mingesz, August C., 4,595,818, Cl. 219-121.0PV.

Cabaraux, Emile: *See—*
Detournay, Jean-Paul; and Cabaraux, Emile, 4,595,477, Cl. 204-253.000.

Cabinet Brot: *See—*
Marques, Michel J. M., 4,595,329, Cl. 414-267.000.

Cachin, Andre : *See—*
Aubry, Julien; and Cachin, Andre , 4,594,947, Cl. 102-307.000.

Cadars, Patrick; and LeFevre, Daniel, to Valeo. Casing for a heat exchanger in an air-conditioner, in particular for a vehicle cabin. 4,595,051, Cl. 165-122.000.

Caird, George J.: *See—*
Bennett, Paul F.; Warwick, James M.; and Caird, George J., 4,595,231, Cl. 296-181.000.

Callahan, Alfred S.: *See—*
Jones, Randolph W.; and Callahan, Alfred S., 4,595,013, Cl. 128-644.000.

Cama, Lovji D.: *See—*
Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., 4,595,750, Cl. 544-90.000.

Camco, Incorporated: *See—*
Schroeder, Alan G., 4,595,054, Cl. 166-217.000.

Campbell, Andrew B.: *See—*
Boyadjieff, George I.; and Campbell, Andrew B., 4,595,062, Cl. 166-379.000.

Campbell, Donald N.: *See—*
Schmidt, John C.; Campbell, Donald N.; and Clay, Sandra B., 4,595,486, Cl. 204-412.000.

Campbell, Henry F.: *See—*
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Dodson, Stuart A., 4,595,683, Cl. 514-222.000.

Canadian General Electric Company Limited: *See—*
Murdoch, James C.; and Klassen, Clarence J., 4,594,880, Cl. 73-32.00R.

Canon Kabushiki Kaisha: *See—*
Kawamura, Naoto; and Masuda, Yukio, 4,595,956, Cl. 358-283.000.
Nakajima, Toshifumi; and Kiyohara, Takehiko, 4,595,936, Cl. 346-139.00R.
Nose, Noriyuki; and Endo, Kiyonobu, 4,595,290, Cl. 356-225.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,595,644, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,595,645, Cl. 430-84.000.
Sakurai, Atsushi, 4,596,032, Cl. 381-51.000.
Sakurai, Masaaki, 4,595,274, Cl. 355-3.0FU.
Sonobe, Hiraku, 4,595,275, Cl. 355-8.000.
Suda, Shigeyuki; Niwa, Yukichi; Ogino, Yasuo; and Ohwada, Mitsutoshi, 4,595,271, Cl. 354-403.000.
Takahashi, Kazuo, 4,595,282, Cl. 355-53.000.
Toganoh, Shigeo; and Arai, Ryuichi, 4,595,931, Cl. 346-1.100.
Tsuboi, Takayuki, 4,595,268, Cl. 354-149.110.
Yamada, Yasuyuki; Fujibayashi, Kazuo; Sato, Yasuhisa; and Yokota, Hideo, 4,595,270, Cl. 354-222.000.

Carcas, Norman J., to Boeing Company, The. Releasable hinge with spring biased pin moving mechanism. 4,594,750, Cl. 16-229.000.

Card-O-Matic Pty. Limited: *See—*
Stanley, Louis, 4,594,775, Cl. 29-736.000.

Cardoso, Jean-Francois; Fink, Mathias; and Hottier, Francois, to U.S. Philips Corporation. Method of and device for scanning objects by ultrasound echography. 4,594,896, Cl. 73-599.000.

Carduck, Franz-Josef: *See—*
Hase, Christian; Baumann, Horst; Carduck, Franz-Josef; and Pawelczyk, Hubert, 4,595,782, Cl. 564-106.000.

Carignan, Donald J.: *See—*
Antonuzzi, Anthony P.; and Carignan, Donald J., 4,595,808, Cl. 200-37.00R.

Caringer, Ronald L. Vehicle seat belt accessory. 4,595,618, Cl. 428-100.000.

Carl Freudenberg, Firma: *See—*
Holzer, Helmut, 4,595,206, Cl. 277-25.000.

Carl Manufacturing Co., Ltd.: *See—*
Mori, Chuzo, 4,594,927, Cl. 83-620.000.

Carl Zeiss Stiftung: *See—*
Herziger, Gerd; and Neff, Willi, 4,596,030, Cl. 378-119.000.

Carleton, Joseph G.: *See—*
Yotam, Reuben; and Carleton, Joseph G., 4,595,495, Cl. 210-101.000.

Carlson, Gregory H.: *See—*
Betteridge, John W.; Hart, Milburn L.; Carlson, Gregory H.; and Carlson, Ronald E., Sr., 4,595,607, Cl. 427-185.000.

Carlson, Herman L. Disc brake caliper piston diagnostic gauge. 4,594,785, Cl. 33-172.00R.

Carlson, Larry W., to United States of America, Energy. Drying of pulverized material with heated condensible vapor. 4,594,793, Cl. 34-10.000.

Carlson, Ronald E., Sr.: *See—*
Betteridge, John W.; Hart, Milburn L.; Carlson, Gregory H.; and Carlson, Ronald E., Sr., 4,595,607, Cl. 427-185.000.

Carlsson, Lars, to Tetra Pak International AB. Opening arrangement for packing containers and a method for the manufacture of the same. 4,595,116, Cl. 220-359.000.

Carlton, Robert E.: *See—*
Watts, Brian R.; and Carlton, Robert E., 4,594,739, Cl. 4-287.000.

Carpentier, John H.: *See—*
Nettesheim, Daniel R.; Nettesheim, Daniel D.; and Carpentier, John H., 4,594,943, Cl. 101-327.000.

Carr, John F.; Kowal, Leonard J.; and Schwarz, Albert J., to Imperial Clevite Inc. Insulative coupling. 4,595,218, Cl. 285-47.000.

Carson, William W., to Millipore Corporation. Liquid composition control. 4,595,496, Cl. 210-101.000.

Carter, Kelly; Gallagher, Steve; Iverson, Gregory; and Krechmer, Kenneth R., to Prentice Corporation. Modem for switching between voice and data communications on a single telephone call. 4,596,021, Cl. 375-5.000.

Carter, Linda G., to Du Pont de Nemours, E. I., and Company. Triazinyl-amino-carbonyl-1,3-benzohetero- or -1,4-benzohetero-sulfonamides. 4,595,407, Cl. 71-90.000.

Carter, Robert E.: *See—*
Kolm, Henry H.; and Carter, Robert E., 4,595,338, Cl. 416-81.000.

Carvani, Luigi: *See—*
Pecci, Giancarlo; Carvani, Luigi; Valentini, Domenico; and Zaninelli, Michele, 4,595,488, Cl. 208-412.000.

Casio Computer Co., Ltd.: *See—*
Ishii, Hiroshi, 4,594,931, Cl. 84-1.030.

Castell-Evans, John V., to Rolls-Royce Motors Limited. Fluid supply apparatus including plural reservoirs and condition responsive control of pump drive motor by contaminant sensing probes. 4,595,341, Cl. 417-1.000.

Castelli S.p.A.: *See—*
Rizzoli, Ennio, 4,595,236, Cl. 297-316.000.

Caterpillar Tractor Co.: *See—*
Dillard, Harvey G., 4,594,760, Cl. 29-156.4WL.
Livesay, Richard E.; and Grawey, Charles E., 4,594,846, Cl. 59-5.000.

Caugherty, William C.; and Whitehorn, Sydney H., to VSI Corporation. Die casting apparatus. 4,595,044, Cl. 164-337.000.

Cauquis, Georges: *See—*
Pierre, Gerard; Kordi, Mokhlis E.; and Cauquis, Georges, 4,595,467, Cl. 204-79.000.

Cavezzan, Jacques, to Rhone-Poulenc Specialites Chimiques. α-Ketone acetylenic inhibited platinum group metal catalyzed organopolysiloxane compositions. 4,595,739, Cl. 528-15.000.

Cayle, Theodore: *See—*
Roland, John F.; Cayle, Theodore; Dinwoodie, Robert C.; and Mehnert, David W., 4,595,659, Cl. 435-135.000.

CDS Development, Inc.: *See—*
Hill, Kenton C.; and Schonacher, Darryl A., 4,595,422, Cl. 134-19.000.

Cease, Richard G.; Favaloro, Caesar J.; and Hackendorf, James G., to Raytheon Company. Asynchronous data clock generator. 4,596,026, Cl. 375-118.000.

CEM - Compagnie Electro-Mecanique: *See—*
Chausse, Bernard; Hellegouarc'h, Jean; and Maurice, Jean, 4,595,813, Cl. 219-10.710.

Cemedine Co., Ltd.: *See—*
Okuno, Eiichi; Okamura, Naomi; Ozawa, Keiji; and Saitoh, Takashi, 4,595,129, Cl. 222-327.000.

Centre National de la Recherche Scientifique (CNRS): *See—*
Labarre, Jean-Francois; Guerch, Guy; Levy, Gaston; and Sournies, Francois, 4,595,682, Cl. 514-83.000.

Le Caer, Gerard; and Dubois, Jean-Marie, 4,595,429, Cl. 148-403.000.
Van Damme, Henri; Fripiat, Jose J.; Nijs, Hubert; Marceau, Philippe; and Francois, Obrecht, 4,595,568, Cl. 422-186.000.

Cesario, Jean: *See*—
Boulin, Yves; Cesario, Jean; and Landeau, Bernard, 4,595,835, Cl. 250-423.00R.

Cessna Aircraft Company, The: *See*—
Gonzalez, Cesar, 4,594,976, Cl. 123-260.000.

Chabot, Paul-Andre . Coin holder. 4,595,100, Cl. 206-0.820.

Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, to Monolithic Memories, Incorporated. Short detector for PROMS. 4,595,875, Cl. 324-73.0PC.

Chan, Wan-Kit: *See*—
Loev, Bernard; and Chan, Wan-Kit, 4,595,696, Cl. 514-513.000.

Chan, Yuen H.; Jones, Frank D.; and Stinson, William F., to International Business Machines Corporation. Random access memory RAM employing complementary transistor switch (CTS) memory cells. 4,596,002, Cl. 365-189.000.

Chang, Y. Alice; Kulkarni, Sudhir S.; and Funk, Edward W., to UOP Inc. Membrane separation of hydrocarbons. 4,595,507, Cl. 210-638.000.

Charbonnier, Roger; Remy, Joel; and Sauvage, Gerard, to Adret Electronique. Microwave transmission line element comprising one or more incorporated switching members for inserting one or more quadripoles. 4,595,893, Cl. 333-246.000.

Chattha, Mohinder S., to Ford Motor Company. Dicarboxylic acid azomethines and high glass transition temperature polyester products produced therefrom. 4,595,761, Cl. 546-263.000.

Chaumel, Francisco M., to Procedimientos Industriales Technologicos para la Fabricacion de Maquinaria y Afines del Calzada, S.A. (PIT MAC, S.A.). Process for the standardization of primary models used in the fabrication of shoes. 4,594,783, Cl. 33-6.000.

Chausse, Bernard; Hellegouarc'h, Jean; and Maurice, Jean, to CEM - Compagnie Electro-Mecanique. Induction heating apparatus for moving metal products. 4,595,813, Cl. 219-10.710.

Chemische Werke Huls Aktiengesellschaft: *See*—
Schmidt, Herbert; and Muller, Richard, 4,596,019, Cl. 373-22.000.

Chen, Duke. Multipurpose timing light. 4,594,886, Cl. 73-116.000.

Chen, Hsiang T.: *See*—
Mendenhall, G. David; and Chen, Hsiang T., 4,595,784, Cl. 568-387.000.

Chen, Tu: *See*—
Allen, Ronald; and Chen, Tu, 4,595,481, Cl. 204-298.000.

Chernega, John G., to Minnesota Mining and Manufacturing Company. Lubricant system for magnetic recording media containing isomeric acids or alcohols. 4,595,640, Cl. 428-695.000.

Cherundolo, Michael; and McMillen, Charles A., to Rain Bird Sprinkler Mfg. Corp. Drive nozzle assembly for a reaction drive sprinkler. 4,595,141, Cl. 239-230.000.

Chester, Arthur W.: *See*—
Chu, Yung F.; Brennan, James A.; and Chester, Arthur W., 4,595,702, Cl. 518-713.000.

Chesterton, S. Keith: *See*—
Cobb, Richard G.; and Chesterton, S. Keith, 4,595,922, Cl. 340-825.490.

Chevron Research Company: *See*—
Deming, John R.; Griston, Suzanne; and Hong, Ki C., 4,595,057, Cl. 166-269.000.
Foller, Peter C., 4,595,469, Cl. 204-98.000.
Frasier, Clint W., 4,596,005, Cl. 367-38.000.

Chicopee: *See*—
Mays, Alfred T., 4,595,629, Cl. 428-286.000.

Chiffert, Alain; Galula, William; and Rousseau, Michel, to Enertec. Electronic meter for measuring active and reactive energies in a three-phase network. 4,595,988, Cl. 364-483.000.

Chimicasa GmbH: *See*—
Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, 4,595,593, Cl. 424-195.100.

Chin, Roland L.: *See*—
Ferguson, Susan A.; and Chin, Roland L., 4,595,649, Cl. 430-296.000.

Chinchar, Victor M. Margin extensions for pads. 4,595,309, Cl. 402-80.00R.

Chitayat, Anwar, to Anorad Corporation. Linear motor. 4,595,870, Cl. 318-687.000.

Cho, Choong M. Water proof paper canister. 4,595,119, Cl. 220-450.000.

Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., to Merck & Co., Inc. Process for chiral synthesis of 1-β-methylcarbapenem intermediates. 4,595,750, Cl. 544-90.000.

Christlieb, Jan; and Muller, Karl. Device for the control of a fluid pressure of a turbomachine engine and support for a pressure pick-off. 4,595,342, Cl. 417-45.000.

Christy Machine Company: *See*—
Fielding, Randy L., 4,595,128, Cl. 222-252.000.

Chu, Yung F.; Brennan, James A.; and Chester, Arthur W., to Mobil Oil Corporation. Conversion of synthesis gas to liquid hydrocarbons. 4,595,702, Cl. 518-713.000.

Chu, Zooey C., to Prince Corporation. Garage door opening transmitter compartment. 4,595,228, Cl. 296-37.700.

Cianci, James P.; Jessup, James L.; and Seeley, Daniel J., to Kendall Company, The. Kit for performing a medical procedure. 4,595,102, Cl. 206-572.000.

Ciba-Geigy Corporation: *See*—
Bennett, Debra A., 4,595,684, Cl. 514-221.000.
Martin, Pierre, 4,595,755, Cl. 546-94.000.
Pissiotas, Georg; and Rohr, Otto, 4,595,410, Cl. 71-105.000.
Riniker, Bernhard; Buhlmayer, Peter; and Fuhrer, Walter, 4,595,677, Cl. 514-17.000.
Roloff, Achim; and Gschwend, Heinz W., 4,595,766, Cl. 548-491.000.
Vlattas, Isidoros, 4,595,535, Cl. 260-243.300.

Cieniawa, Edward: *See*—
Krob, Dennis J.; Cieniawa, Edward; and Liburdi, Francesio, 4,595,799, Cl. 179-98.000.

Clairol Incorporated: *See*—
Murphy, Bryan P., 4,595,765, Cl. 548-491.000.

Clancy, Joseph S.; and Heideman, Robert J., to Sash Controls, Inc. Sliding door construction. 4,594,812, Cl. 49-404.000.

Clark, Benton C., III: *See*—
Thornton, Michael G.; and Clark, Benton C., III, 4,595,561, Cl. 422-58.000.

Clark, Robin; and Povzhitkov, Moysey M., to Syntex (U.S.A.) Inc. Antihypertensive dihydropyridine derivatives. 4,595,690, Cl. 514-356.000.

Clarke, John A., to U.S. Philips Corporation. Projection lens system. 4,595,263, Cl. 350-432.000.

Clay, Sandra B.: *See*—
Schmidt, John C.; Campbell, Donald N.; and Clay, Sandra B., 4,595,486, Cl. 204-412.000.

Cleaver, Laird C.: *See*—
Baron, Walter J.; and Cleaver, Laird C., 4,595,049, Cl. 165-95.000.

Clement, Burke. Spade drill bit. 4,595,322, Cl. 408-230.000.

Clements, John L.; and Magnusson, Stig E., to GTE Automatic Electric Inc. Failure detection apparatus for use with digital pads. 4,596,015, Cl. 371-51.000.

Close, Leo R., to Israel, Mrs. Lawrence. Electronic surveillance system employing the doppler effect. 4,595,915, Cl. 340-572.000.

Cloutier, Donald C., to Omni Spectra, Inc. Dual polarization transition and/or switch. 4,595,890, Cl. 333-103.000.

Cobb, Richard G.; and Chesterton, S. Keith. Method and apparatus for monitoring keys and other articles. 4,595,922, Cl. 340-825.490.

Coe, Stanley S.: *See*—
Bhatt, Vipul J.; Mann, Alan B.; and Coe, Stanley S., 4,595,255, Cl. 350-96.200.

Coellner, James A.; MacIntosh, David S.; and Blanpied, Mark C., to American Solar King Corporation. Open cycle desiccant air-conditioning system and components thereof. 4,594,860, Cl. 62-271.000.

Cofer, Wesley R., III: *See*—
Collins, Vernon G.; and Cofer, Wesley R., III, 4,595,399, Cl. 55-255.000.

Coffin, Ronald. Coupled dual cone velocity driver speaker. 4,595,801, Cl. 179-115.5PS.

Cogema et Framatome: *See*—
Vere, Bernard; Mathevon, Paul; and Le Pargneux, Jacques, 4,595,815, Cl. 219-58.000.

Cognevich, Kenneth J., Sr.; and Robichaux, Joseph E., Jr., to Engine Monitor, Inc. Steering amplifier. 4,595,867, Cl. 318-588.000.

Cohen, Howard J.; van der Heem, Peter; and Fitch, Steven J., to SCM Corporation. Stabilized silica gel and process for making same. 4,595,578, Cl. 423-338.000.

Cohen, Judith S.; Browning, Joel W.; and Gopffarth, Wilford H., to Thomson Components-Mostek Corporation. Water-polishing loop. 4,595,498, Cl. 210-192.000.

Cohen, Lewis S., to Venture Tape Corp. Pipe insulation for cold weather applications. 4,595,615, Cl. 428-36.000.

Cohen, Sidney M., to Fuller Company. Method and apparatus for producing cement clinker including white cement. 4,595,416, Cl. 106-100.000.

Cole, Edgar C. Instructional apparatus for underwater welding. 4,595,368, Cl. 434-234.000.

Coleman, Edwin B.: *See*—
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., 4,594,848, Cl. 60-39.020.

Colgate-Palmolive Company: *See*—
Lai, Kuo-Yann, 4,595,526, Cl. 252-545.000.
Tavss, Edward A.; and Temin, Samuel C., 4,595,612, Cl. 428-35.000.
Tavss, Edward A.; and Temin, Samuel C., 4,595,613, Cl. 428-35.000.

Collins, Nigel W.: *See*—
Barker, Allan; and Collins, Nigel W., 4,594,774, Cl. 29-723.000.

Collins, Vernon G.; and Cofer, Wesley R., III, to United States of America, National Aeronautics and Space Administration. Nebulization reflux concentrator. 4,595,399, Cl. 55-255.000.

Commissariat a l'Energie Atomique: *See*—
Aubry, Julien; and Cachin, Andre , 4,594,947, Cl. 102-307.000.
Boulin, Yves; Cesario, Jean; and Landeau, Bernard, 4,595,835, Cl. 250-423.00R.

Communications Satellite Corporation: *See*—
Kreutel, Randall W., Jr., 4,595,929, Cl. 343-781.00P.

Company "A" (Foam) Limited: *See*—
Albertelli, Aldino; Hohmann, Lothar M.; and Curtis, Anthony N., 4,595,710, Cl. 521-100.000.

Complexx Systems, Inc.: *See*—
Driver, R. Byron; and Fullerton, Larry, 4,596,023, Cl. 375-55.000.

Comploi, Georg; Loacker, Arthur; Huber, Kurt; Hutter, Wilhelm; and Wallimann, Hans, to Aktiengesellschaft Adolph Saurer. Embroidering machine. 4,594,952, Cl. 112-84.000.

Compton, Bruce J.; and Hinsvark, Orville N., to Pennwalt Corporation. Method and apparatus for sample retrieval from pharmaceutical dissolution testers. 4,594,902, Cl. 73-863.230.

Compton, Russell A.: *See—*
Lent, Arnold H.; Hinshaw, Waldo S.; and Compton, Russell A., 4,595,879, Cl. 324-309.000.

Computer Services Corporation: *See—*
Takiguchi, Kiyoaki, 4,595,104, Cl. 209-548.000.

Connell, Brian P.: *See—*
Brooks, Ralf M.; Vyas, Arvindkumar C.; and Connell, Brian P., 4,595,935, Cl. 346-76.0PH.

Connelly, John R., to Wells Lamont Corporation. Curved clute-cut glove construction. 4,594,736, Cl. 2-163.000.

Conoco Inc.: *See—*
Salama, Mamdouh M.; and Pan, Robert B., 4,595,311, Cl. 403-271.000.

Conrad, Hans-Jurgen; Mauz, Wolfgang; and Schildhorn, Walter, to Robert Bosch GmbH. Apparatus for treating workpieces in a combustion chamber. 4,595,359, Cl. 432-205.000.

Consolidated Metal Products, Inc.: *See—*
Gallagher, Hugh M., Jr., 4,595,315, Cl. 405-261.000.

Conta, Renatol; and Manini, Enrico, to Ing. C. Olivetti & C., S.p.A. Ink jet print head. 4,595,937, Cl. 346-140.00R.

Conta, Renatol; and Manini, Enrico, to Ing. C. Olivetti & C., S.p.A. Ink jet print head. 4,595,938, Cl. 346-140.00R.

Conti, Rino: *See—*
Zaruba, John V.; Morrison, Howard J.; and Conti, Rino, 4,595,099, Cl. 206-525.000.

Continental Can Company, Inc.: *See—*
Walter, John, 4,595,117, Cl. 220-359.000.

Controls Company of America: *See—*
Torrence, Robert J., 4,595,171, Cl. 251-129.070.

Cook, Anthony J.: *See—*
Sinnadurai, F. Nihal; Cook, Anthony J.; and Gurnett, Keith W., 4,595,096, Cl. 206-331.000.

Cook, Richard H., to Cubeco, Inc. Pneumatic conveying system elbow. 4,595,319, Cl. 406-195.000.

Coolair Corporation PTE., Ltd.: *See—*
Kearney, Anthony D., 4,594,861, Cl. 62-304.000.

Cooper, Alvin J. Combination tool for gas welders. 4,595,136, Cl. 228-57.000.

Cooper Industries, Inc.: *See—*
Lofstrand, Warren A., 4,595,811, Cl. 200-284.000.

Copeland Corporation: *See—*
Shaw, David N., 4,594,858, Cl. 62-175.000.

Cordis Corporation: *See—*
Giurtino, Joel F., 4,595,641, Cl. 429-1.000.

Corless, Murray B. Pneumatically restorable retractable pavement marker and method of fabricating same. 4,595,312, Cl. 404-11.000.

Cortese, Richard: *See—*
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,595,583, Cl. 424-15.000.

Coste, Camille; Crozat, Georges; and Mauran, Sylvain, to Societe Nationale Elf Aquitaine. Gaseous-solid reaction. 4,595,774, Cl. 556-118.000.

Couch, Philip R.: *See—*
Wright, Stephen; and Couch, Philip R., 4,596,052, Cl. 455-619.000.

Couch, Robert P.: *See—*
Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., 4,595,987, Cl. 364-431.020.

Courtwright, Joel G.: *See—*
Henson, Edwin R.; Masterson, Tipton T.; and Courtwright, Joel G., 4,595,723, Cl. 524-398.000.

Crabtree, Charley B. Latch for livestock panels. 4,595,176, Cl. 256-52.000.

Cragle, Linda K.; Harris, Paul C.; Lee, Shih-Yun; Tung, Ker-Kong; and Vodian, Morton A., to Beckman Instruments, Inc. Immunoassays and kits for use therein which include low affinity antibodies for reducing the hook effect. 4,595,661, Cl. 436-534.000.

Craig, James E.: *See—*
Bacon, Jeffery E.; Craig, James E.; and Pedersen, Mark K., 4,595,464, Cl. 204-15.000.

Cramb, James C. Drawing apparatus. 4,594,792, Cl. 33-562.000.

Crass, Gunther; Bothe, Lothar; Janocha, Siegfried; and Dietz, Wolfgang, to Hoechst Aktiengesellschaft. Sealable multilayer film for packaging purposes. 4,595,625, Cl. 428-215.000.

Crawford, Michael C.: *See—*
Marino, Joseph A.; Puetz, Peter A.; Kling, Michael J.; Finn, Curtis A.; Pendell, John C.; and Crawford, Michael C., 4,594,789, Cl. 33-288.000.

Crea, David A.; Robertson, James A.; and Keely, Jerry A., to FMC Corporation. Recovery of phosphorus from dilute waste streams. 4,595,492, Cl. 209-2.000.

Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Ethanediimidamide intermediates. 4,595,758, Cl. 546-212.000.

Criswell, Peter B.: *See—*
Kregness, Glen R.; Dekarske, Clarence W.; and Criswell, Peter B., 4,595,911, Cl. 340-347.0DD.

Crites, Allan B.: *See—*
Arlasky, David F.; Arlasky, Ronald F.; Crites, Allan B.; Miller, Carol; Pellicano, Anthony J.; and Weinberger, Frank W., 4,595,903, Cl. 340-64.000.

Crompton & Knowles Corporation: *See—*
Wheeler, John R., Jr., 4,595,546, Cl. 264-83.000.

Cronauer, Edward A., to United Technologies Corporation. Microwave combiner having means to isolate between input terminals. 4,595,891, Cl. 333-127.000.

Cross, Virginia R.: *See—*
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,595,668, Cl. 502-66.000.
Tauster, Samuel J.; Montagna, Angelo A.; Steger, John J.; Fung, Shun C.; and Cross, Virginia R., 4,595,670, Cl. 502-74.000.

Croudace, Michael C.: *See—*
Holstedt, Richard A.; and Croudace, Michael C., 4,595,514, Cl. 252-46.400.

Crounse, Nathan N.: *See—*
Schmidt, Paul J.; and Crounse, Nathan N., 4,595,768, Cl. 549-307.000.

Crowe, Scott D. Hub for wind machines. 4,595,337, Cl. 416-131.000.

Crozat, Georges: *See—*
Coste, Camille; Crozat, Georges; and Mauran, Sylvain, 4,595,774, Cl. 556-118.000.

Csaba, Gyorgy: *See—*
Balogh, Gyorgy; and Csaba, Gyorgy, 4,595,582, Cl. 424-3.000.

Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Gandini, Marco; and Trevisan, Dante, 4,595,940, Cl. 357-42.000.

Cubeco, Inc.: *See—*
Cook, Richard H., 4,595,319, Cl. 406-195.000.

Cuenoud, Gerard, to Les Produits Associes LPA SA. Small a.c. motor having an oscillatory permanent magnet armature. 4,595,849, Cl. 310-36.000.

Curran, Neal J.: *See—*
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; Wiatrak, Thomas R.; and Curran, Neal J., 4,595,212, Cl. 280-242.0WC.

Curtis, Anthony N.: *See—*
Albertelli, Aldino; Hohmann, Lothar M.; and Curtis, Anthony N., 4,595,710, Cl. 521-100.000.

Custom Packaging Systems: *See—*
LaFleur, Arthur E.; LaFleur, Arnie; and LaFleur, Lee, 4,596,040, Cl. 383-7.000.

Czaikowski, Michael P.: *See—*
Ozero, Brain J.; Czaikowski, Michael P.; and Gimpel, H. Edward, 4,595,404, Cl. 62-18.000.

Czech, Kurt. Apparatus for the treatment of the lungs of humans or animals. 4,595,004, Cl. 128-204.210.

D.A.B. Industries, Inc.: *See—*
Pike, Ronald J., 4,595,450, Cl. 156-500.000.

Dahlem, Francis E.: *See—*
Silletto, John L.; and Dahlem, Francis E., 4,595,402, Cl. 55-378.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, 4,594,868, Cl. 72-12.000.

Daido Kasei Kogyo Kabushiki Kaisha: *See—*
Murakami, Takeomi; and Ishikawa, Nobuo, 4,595,417, Cl. 106-309.000.

Daikin Kogyo Co., Ltd.: *See—*
Murakami, Takeomi; and Ishikawa, Nobuo, 4,595,417, Cl. 106-309.000.

Daimler-Benz: *See—*
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.

Daimler-Benz Aktiengesellschaft: *See—*
Mehren, Herbert, 4,595,071, Cl. 180-132.000.

Dainichi Sangyo K. K.: *See—*
Tokoro, Toranosuke, 4,594,811, Cl. 47-65.000.

Daino, Mario: *See—*
Seybold, Anton; Gutierrez, Alejandro; Arkenberg, Pablo; and Daino, Mario, 4,595,511, Cl. 252-8.55B.

d'Alayer de Costemore d'Arc, Stephane M., to Staar S.A. Adapter for video cassette. 4,595,962, Cl. 360-94.000.

D'Almeida, Werner K.; and Boeck, Oldemar, to Sperry Corporation. Pneumatic system for combine header height control. 4,594,840, Cl. 56-11.200.

D'Aloisio, Rino: *See—*
Venturello, Carlo; D'Aloisio, Rino; and Ricci, Marco, 4,595,671, Cl. 502-159.000.

Daly, John J., Jr.: *See—*
Bartlett, Philip L.; Daly, John J., Jr.; and Sterling, John D., Jr., 4,595,522, Cl. 252-305.000.

Dan, Takuya; Kojima, Hiroshi; and Orikawa, Michihiro, to Bridgestone Tire Company Limited. Vibration isolating device. 4,595,183, Cl. 267-140.100.

Daniels, Arthur C.: *See—*
Gershman, Russell J.; Weiner, Irving L.; and Daniels, Arthur C., 4,596,035, Cl. 382-6.000.

Daniels, Edward P., to Pitney Bowes Inc. Apparatus and method for determining special postage fees. 4,595,984, Cl. 364-466.000.

Danno, Yoshiaki: *See—*
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; and Ueda, Atsushi, 4,594,982, Cl. 123-425.000.
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; Ueda, Atsushi; and Sasaki, Takeo, 4,594,983, Cl. 123-425.000.

Danton, John L.: *See—*
Bouchard, Donald R.; Danton, John L.; Dawson, Kevin A.; and Sloma, David J., 4,596,037, Cl. 382-8.000.

Dart Industries, Inc.: *See—*
Pool, L. Franklin, 4,595,809, Cl. 200-76.000.

Daubenspeck, Ronald E.; Smyth, Robert R.; and Speranza, Donald, to Eaton Corporation. Method for control of automatic mechanical

transmission system utilizing a microprocessor based electronic controller. 4,595,986, Cl. 364-424.100.

Dautremont-Smith, William C.; and Wilt, Daniel P., to AT&T Bell Laboratories. Fabrication of grooved semiconductor devices. 4,595,454, Cl. 156-647.000.

Davidson, Thomas A.; and Thomas, Telfer L., to Pennwalt Corporation. Cyclohexane carboxylic acids and derivatives thereof as antidysrhythmic agents. 4,595,759, Cl. 546-234.000.

Davies, Ian; and Howard, Anthony M., to Plessey Overseas Limited. Method of making diamond heatsink assemblies. 4,595,603, Cl. 427-82.000.

Davis, James A.: *See—*
Beckner, Mark W.; Davis, James A.; Gausmann, Eric J.; Hiller, Thomas L.; Olson, Philip D.; and Van Dine, Gilbert A., 4,596,010, Cl. 370-60.000.

Davis, Walter L.; and DeLuca, Michael J., to Motorola, Inc. On/off power detector. 4,595,972, Cl. 363-15.000.

Davis, Walter L.: *See—*
Prieto, Yolanda; and Davis, Walter L., 4,595,885, Cl. 330-303.000.

Dawson, Charles W.: *See—*
Parmet, Arthur A.; and Dawson, Charles W., 4,595,997, Cl. 364-900.000.

Dawson, Kevin A.: *See—*
Bouchard, Donald R.; Danton, John L.; Dawson, Kevin A.; and Sloma, David J., 4,596,037, Cl. 382-8.000.

Dayco Corporation: *See—*
Henderson, Dewey D., 4,595,385, Cl. 474-201.000.
Kleykamp, Donald L., 4,594,949, Cl. 105-377.000.

Dean, John R., to FL Industries, Inc. Vented luminaire fixture. 4,595,971, Cl. 362-345.000.

Dear, George W.: *See—*
Knepper, J. Irvine; Garrecht, Robert J.; and Dear, George W., 4,595,523, Cl. 252-390.000.

DeBaun, Kenneth W.; and Morris, Robert H., to Air Monitor Corporation. Airflow measuring sound attenuator. 4,594,888, Cl. 73-198.000.

de Boer, Nico, to McDermott, Inc. Reel type continuous marine pipe laying system. 4,594,871, Cl. 72-164.000.

de Geus, Richard; and Grubish, James J., to Priam Corporation. Disc transfer device. 4,595,221, Cl. 294-16.000.

Deghenghi, Romano: *See—*
Bru-Magniez, Nicole; Teulon, Jean-Marie; and Deghenghi, Romano, 4,595,686, Cl. 514-236.000.

Degobert, Paul; Maute, Michel; and Banet, Gerald, to Institut Francais du Petrole. Process and device for determining the composition of an alcohol-petrol mixture, adapted to the automatic regulation of engines fed with fuel mixtures having a variable alcohol content. 4,594,968, Cl. 123-1.00A.

Degrave, Philippe L., to Kontron Holding A.G. Apparatus for sample transfer and analysis by centrifugation. 4,595,563, Cl. 422-72.000.

Deguchi, Takashi: *See—*
Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, 4,595,701, Cl. 518-701.000.

Degussa Aktiengesellschaft: *See—*
Panster, Peter, 4,595,740, Cl. 528-30.000.

de Haan, Simon, to Shell Oil Company. Burner with ignition device. 4,595,353, Cl. 431-263.000.

Deininger, Rolf: *See—*
Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, 4,595,593, Cl. 424-195.100.

Dejewski, Karen: *See—*
Kormanik, Richard; Dejewski, Karen; and Brummond, Robert, 4,595,499, Cl. 210-202.000.

DeKalb Pfizer Genetics: *See—*
Troyer, A. Forrest, 4,594,810, Cl. 47-58.000.

Dekarske, Clarence W.: *See—*
Kregness, Glen R.; Dekarske, Clarence W.; and Criswell, Peter B., 4,595,911, Cl. 340-347.0DD.

DeLano, Arthur D.; and Langs, Truman H., Jr. Puzzle reading device. 4,595,203, Cl. 273-148.00R.

della Valle, Francesco; and Romeo, Aurelio, to FIDIA, S.p.A. Pharmaceutical compositions and method for preparing phosphatidylserine compositions useful in treating central nervous system disorders without effects on blood coagulation. 4,595,680, Cl. 514-77.000.

DeLuca, Michael J.: *See—*
Davis, Walter L.; and DeLuca, Michael J., 4,595,972, Cl. 363-15.000.

De Luca, Robert D.; and Forbes-Jones, Robin M., to Johnson & Johnson Dental Products Company. Crystalline alumina composites. 4,595,598, Cl. 427-2.000.

DelVecchio, Robert M.; and Krause, Robert F., to Westinghouse Electric Corp. Low core loss rotating flux transformer. 4,595,843, Cl. 307-83.000.

Deming, John R.; Griston, Suzanne; and Hong, Ki C., to Chevron Research Company. Parallel string method for multiple string, thermal fluid injection. 4,595,057, Cl. 166-269.000.

Dempsey, Mary A. Work support with cleaning structure. 4,594,747, Cl. 15-301.000.

Denneboom, Else M., to B.V. Machinefabriek BOA. Baling press with large supply hopper. 4,594,942, Cl. 100-137.000.

Derringer, Gene R., to Monarch Marking Systems, Inc. Mold for making a fastener assembly. 4,595,169, Cl. 249-67.000.

DeSantis, Raymond P., to PTX-Pentronix, Inc. Sagger loader and conveyor apparatus and method. 4,594,839, Cl. 53-475.000.

Detournay, Jean-Paul; and Cabaraux, Emile, to Solvay & Cie. Electrolysis cell. 4,595,477, Cl. 204-253.000.

DeTray, Ralph F.: *See—*
Murphy, James E.; and DeTray, Ralph F., 4,595,146, Cl. 239-682.000.

Dettmer, Jay R., to Sperry Corporation. Stroke writing character generator with reduced bandwidth. 4,595,918, Cl. 340-739.000.

Detweiler, Charles A., to Tom McGuane Industries, Inc. Throttle positioning device. 4,594,980, Cl. 123-376.000.

Deutsche-Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Wiegand, Herbert; and Baumer, Klaus, 4,595,144, Cl. 239-533.300.

Deutsche Thomson-Brandt GmbH: *See—*
Maier, Gerhard, 4,596,045, Cl. 455-189.000.

Devaux, Albert F. L. G.; and Moniotte, Philippe G., to Monsanto Europe, S.A. Compounds useful as stabilizing agents for rubber vulcanizates. 4,595,721, Cl. 524-160.000.

DeVera, Dennis, to Eaton Corporation. Slide switch. 4,595,807, Cl. 200-16.00C.

Diaz Carmena, Angel: *See—*
Manueco Santurtun, Carlos; and Diaz Carmena, Angel, 4,596,029, Cl. 378-105.000.

Dibold, Camille; and Rubach, Frederic, to Joustra S.A. Toy vehicle with electric motor. 4,595,381, Cl. 446-463.000.

Dickmeyer, Ronald J.: *See—*
Newkirk, Raymond K.; and Dickmeyer, Ronald J., 4,595,446, Cl. 156-356.000.

Dicks, Lynton W. R.: *See—*
Liu, Chih-hsiung F.; and Dicks, Lynton W. R., 4,595,297, Cl. 374-29.000.

Dickson, Richard A.; and Forrester, Allen H., to Omni Direct Mail Services, Ltd. Apparatus for applying a decorative seal to envelopes and the like. 4,595,351, Cl. 425-114.000.

Didde Graphic Systems Corporation: *See—*
Propheter, Howard L., 4,594,926, Cl. 83-345.000.

Diehl GmbH & Co.: *See—*
Potthof, Erwin, 4,595,967, Cl. 361-152.000.
Ringel, Konrad; and Vockentanz, Rainer, 4,594,946, Cl. 102-307.000.

Diesel Kiki Co., Ltd.: *See—*
Arai, Kenji; Inamo, Masaharu; and Kurihara, Kazumasa, 4,595,979, Cl. 364-174.000.

Dietrich, Herbert: *See—*
McAllister, Lawrence E.; Dietrich, Herbert; and Hill, John E., Jr., 4,595,714, Cl. 523-179.000.

Dietz, Wolfgang: *See—*
Crass, Gunther; Bothe, Lothar; Janocha, Siegfried; and Dietz, Wolfgang, 4,595,625, Cl. 428-215.000.

Diffrient, Niels, to Hauserman, Inc. Lamp. 4,595,970, Cl. 362-287.000.

DiFilipantonio, Rudolph G.: *See—*
Raynolds, Stuart; and DiFilipantonio, Rudolph G., 4,595,518, Cl. 252-8.600.

Dighton, Gaylon L.; and McLemore, Jane K., to Dow Chemical Company, The. Dead-folded articles from fiber-reinforced plastics. 4,595,620, Cl. 428-121.000.

Digweed, Thomas: *See—*
Mackenzie, Robert; and Digweed, Thomas, 4,595,083, Cl. 188-196.00C.

Dillard, Harvey G., to Caterpillar Tractor Co. Apparatus for and method of packaging and inserting an engine cylinder assembly into an engine block. 4,594,760, Cl. 29-156.4WL.

DiMarco, Bernard; and Stanford, Charles W., to Siemens-Allis, Inc. Molded case circuit breaker having a reinforced housing. 4,595,896, Cl. 335-202.000.

Dinwoodie, Robert C.: *See—*
Roland, John F.; Cayle, Theodore; Dinwoodie, Robert C.; and Mehnert, David W., 4,595,659, Cl. 435-135.000.

Disdier, Camille: *See—*
Amiet, Louis; and Disdier, Camille, 4,595,541, Cl. 260-546.000.

Dispennett, David: *See—*
Zorn, Robert; and Dispennett, David, 4,594,876, Cl. 72-414.000.

Dittmer, Catherine A.: *See—*
Dubrow, Robert S.; Dittmer, Catherine A.; and Uken, William D., 4,595,635, Cl. 428-447.000.

Doak, Kenneth W. Blends of a polyglutarimide with a rubber-modified vinyl chloride resin. 4,595,727, Cl. 525-71.000.

Dr. Boger Photosatz GmbH: *See—*
Holthusen, Bernd, 4,595,957, Cl. 358-290.000.

Dr. Ing. h.c.F. Porsche AG: *See—*
Ziegler, Gerhard, 4,594,917, Cl. 74-572.000.

Dr. Johannes Heidenhain GmbH: *See—*
Spies, Alfons, 4,595,991, Cl. 364-525.000.

Dr. Madaus & Co.: *See—*
Hietala, Pentti, 4,595,592, Cl. 424-195.100.

Dodge, Cleveland E., Jr.; and Stafford, Lawrence R., to International Dodge, Inc. Horizontal line grip device. 4,595,174, Cl. 254-391.000.

Dodson, Stuart A.: *See—*
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Dodson, Stuart A., 4,595,683, Cl. 514-222.000.

Doebber, Thomas W.: *See—*
Biftu, Tesfaye; Doebber, Thomas W.; Hwang, San-Bao; Beattie, Thomas R.; Shen, Tsung-Ying; and Stevenson, Robert, 4,595,693, Cl. 514-461.000.

Dohnomoto, Tadashi; and Kubo, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Composite material made from matrix metal reinforced with mixed alumina fibers and mineral fibers. 4,595,638, Cl. 428-614.000.

Dollhausen, Manfred: *See—*
Hombach, Rudolf; Dollhausen, Manfred; Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Reischl, Artur, 4,595,445, Cl. 156-307.300.
Dona, Marinus J. J.; Franken, Adrianus J. J.; Haes, Freddy; and Reynhout, Cornelis M., to U.S. Philips Corporation. Shaving unit. 4,594,778, Cl. 30-43.900.
Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., to G. D. Searle & Co. Thiol based collagenase inhibitors. 4,595,700, Cl. 514-616.000.
Done, Kenneth C. W., to United Kingdom Atomic Energy Authority. Rotary drum. 4,595,177, Cl. 266-248.000.
Donn Incorporated: *See—*
Mieyal, David F., 4,594,833, Cl. 52-806.000.
Donnelly, James R.: *See—*
Andreasen, Jens; Donnelly, James R.; Felsvang, Karsten S.; Jons, Ebbe S.; and Veltman, Preston L., 4,595,576, Cl. 423-242.000.
Dor, Inka, to Solmat Systems, Ltd. Method for suppressing algal growth in solar ponds. 4,595,505, Cl. 210-602.000.
Dow Chemical Company, The: *See—*
Dighton, Gaylon L.; and McLemore, Jane K., 4,595,620, Cl. 428-121.000.
Fazio, Michael J., 4,595,704, Cl. 521-31.000.
Henson, Edwin R.; Masterson, Tipton T.; and Courtwright, Joel G., 4,595,723, Cl. 524-398.000.
Laughner, Michael K.; Porter, James R.; and Huber, Lee M., 4,595,743, Cl. 528-73.000.
McCreedy, Kathleen M.; Kramer, Edward J.; and Tung, Lu H., 4,595,707, Cl. 521-62.000.
Milligan, Dennis J.; and Rolland, Phil, 4,595,706, Cl. 521-53.000.
Renga, James M.; and Wang, Pen-Chung, 4,595,763, Cl. 546-290.000.
Dow Corning Corporation: *See—*
Fey, Kenneth C.; and Lefler, Harold V., III, 4,595,610, Cl. 428-319.300.
Haluska, Loren A., 4,595,472, Cl. 522-99.000.
Downing, Verlon D., to Raleigh Cycle Company of America. Bicycle parking brake. 4,595,214, Cl. 280-296.000.
Downs, Arthur R. Educational and amusement device. 4,595,369, Cl. 434-302.000.
Doyle, Richard C.; and Rivera, Lester, to Leviton Manufacturing Co., Inc. Ground fault circuit interrupting system. 4,595,894, Cl. 335-18.000.
Drake, Charles A., to Phillips Petroleum Company. Potassium carbonate supports, catalysts and olefin dimerization processes therewith. 4,595,787, Cl. 585-516.000.
Drake, Eric F., to Reed Tool Company. Rotary drill bit, parts therefor, and method of manufacturing thereof. 4,595,067, Cl. 175-331.000.
Drake, Roger F.: *See—*
Mayhan, Kenneth G.; Janssen, Robert A.; and Drake, Roger F., 4,595,632, Cl. 428-409.000.
Dresser Industries, Inc.: *See—*
Fertl, Walter H.; and Rukhovets, Naum, 4,594,887, Cl. 73-152.000.
Patel, Arvind D., 4,595,736, Cl. 526-271.000.
Walsh, Richard D., Jr., 4,595,033, Cl. 137-529.000.
Drew, Robin A. L.; Muir, Wilson B.; and Williams, William M., to Royal Institution for the Advancement of Learning (McGill University), The. Annealing process control method and apparatus. 4,595,427, Cl. 148-129.000.
Driver, R. Byron; and Fullerton, Larry, to Complexx Systems, Inc. Balanced biphase transmitter using reduced amplitude of longer pulses. 4,596,023, Cl. 375-55.000.
Drogin, Edwin M., to Eaton Corporation. Encoding and decoding device for narrow bandwidth coherent signals. 4,595,992, Cl. 364-569.000.
D'Silva, Themistocles D. J., to Union Carbide Corporation. Carbamatesulfenyl-carbamoyl fluoride compounds. 4,595,769, Cl. 549-470.000.
Dubois, Jean-Marie: *See—*
Le Caer, Gerard; and Dubois, Jean-Marie, 4,595,429, Cl. 148-403.000.
Dubois, Robert A., to Greif Bros. Corporation. Thermal container. 4,595,112, Cl. 220-5.00R.
Dubrow, Robert S.; Dittmer, Catherine A.; and Uken, William D., to Raychem Corporation. Organopolysiloxane materials having decreased surface tack. 4,595,635, Cl. 428-447.000.
Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, to BASF Aktiengesellschaft. Preparation of methacrylic acid and catalyst therefor. 4,595,778, Cl. 560-208.000.
Dugan, Larry M.: *See—*
Thompson, Roger A.; McCullough, Davey L.; Dugan, Larry M.; and Branch, Lewis R., 4,595,331, Cl. 414-347.000.
DuLaney, Donald C.; and Lindsay, Robert H., to Lindsay Finishes, Inc. Drier catalyst for coating compositions. 4,595,415, Cl. 106-264.000.
Dulk, Karoly, to Vilati Villamos Automatika Fovallalkozo es Gyarto Vallalat. Inductive loop system for detection of an electrically conductive object. 4,595,877, Cl. 324-239.000.
Dulux Australia Ltd.: *See—*
Gould, Jerome; and Kellogg, Thomas W., 4,595,111, Cl. 215-303.000.
Such, Christopher H., 4,595,722, Cl. 514-296.000.
Dunki-Jacobs, Robert J., to General Electric Company. Optically isolated contention bus. 4,596,048, Cl. 455-602.000.
Du Pont de Nemours, E. I., and Company: *See—*
Bartlett, Philip L.; Daly, John J., Jr.; and Sterling, John D., Jr., 4,595,522, Cl. 252-305.000.
Bissot, Thomas C., 4,595,476, Cl. 204-252.000.
Brake, Loren D., 4,595,785, Cl. 568-698.000.
Carter, Linda G., 4,595,407, Cl. 71-90.000.
Grossa, Mario, 4,595,651, Cl. 430-394.000.
Raynolds, Stuart; and DiFilipantonio, Rudolph G., 4,595,518, Cl. 252-8.600.
Sundet, Sherman A., 4,595,708, Cl. 521-63.000.
Waller, Francis J., 4,595,786, Cl. 568-835.000.
Wilkinson, William K., 4,595,731, Cl. 525-329.100.
Du Pont, Preston S.; Freeman, Janet E.; Ritter, Robert E.; and Wittmann, Alois, to Hughes Aircraft Company. Fiber-reinforced syntactic foam composites and method of forming same. 4,595,623, Cl. 428-195.000.
Duran, Reginald F.; and Brass, Jack L. Heat treatment furnace and method of construction. 4,595,826, Cl. 219-400.000.
Duval, Ernest H.; and Nigro, Louis V., to Gillette Company, The. Semi-solid cylindrical container and dispenser. 4,595,124, Cl. 222-39.000.
Dworak, Ulf: *See—*
Krohn, Ulrich; Olapinski, Hans; and Dworak, Ulf, 4,595,663, Cl. 501-103.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Finsterwalder, Klemens, 4,594,827, Cl. 52-230.000.
Dyer, Thomas A., to Pentek Corporation. Load-pusher assembly for conveyor systems. 4,595,092, Cl. 198-456.000.
E.H. Ashley & Company, Inc.: *See—*
Klier, Kurt; and Klier, Heinz, 4,594,847, Cl. 59-85.000.
E. R. Squibb & Sons, Inc.: *See—*
Nakane, Masami, 4,595,692, Cl. 514-443.000.
Eastman Kodak Company: *See—*
Wu, Stephen H. W.; and Sandhu, M. Akram, 4,595,584, Cl. 424-19.000.
Eastmond, Bruce C.: *See—*
Richardson, Julian H.; and Eastmond, Bruce C., 4,596,046, Cl. 455-260.000.
Eaton Corporation: *See—*
Daubenspeck, Ronald E.; Smyth, Robert R.; and Speranza, Donald, 4,595,986, Cl. 364-424.100.
DeVera, Dennis, 4,595,807, Cl. 200-16.00C.
Drogin, Edwin M., 4,595,992, Cl. 364-569.000.
Moran, Thomas M.; and Laudi, Dante A., 4,595,325, Cl. 411-173.000.
Preston, David M.; and Soeters, Raymond A., Jr., 4,595,349, Cl. 418-206.000.
Ryczek, Lawrence J., 4,595,848, Cl. 307-597.000.
Eaton, Harry E.; and Novak, Richard C., to United Technologies Corporation. Plasma coatings comprised of sprayed fibers. 4,595,637, Cl. 428-608.000.
Eberle, George F.: *See—*
Pellerin, Roy F.; Galligan, William L.; and Eberle, George F., 4,594,900, Cl. 73-806.000.
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., to ALZA Corporation. Delivery system controlled administration of beneficial agent to ruminants. 4,595,583, Cl. 424-15.000.
Eckstein, John P.; Gillespie, William S.; and Schaefer, Suzanne E., to American Can Company. Collapsible dispensing tube with an orifice sealed with multi-layer sealant sheet material. 4,595,434, Cl. 156-69.000.
Eckstein, Joseph H., to Procter & Gamble Company, The. Package of compressed resilient articles and concomitant method of unpackaging. 4,595,093, Cl. 206-44.00R.
Economics Laboratory, Inc.: *See—*
Heile, Bernard J.; and Klos, Terry J., 4,595,520, Cl. 252-160.000.
Edel, Alan; Edel, Julian; and Asher, Edgar. Method of and apparatus for cleaning teeth. 4,595,365, Cl. 433-216.000.
Edel, Julian: *See—*
Edel, Alan; Edel, Julian; and Asher, Edgar, 4,595,365, Cl. 433-216.000.
Edele, Reinhard: *See—*
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.
Eder, Kenneth C., to Honeywell Inc. Ultrasonic object detector. 4,596,006, Cl. 367-87.000.
Edlin, George R., to United States of America, Army. Doppler effect laser velocity measuring system. 4,595,287, Cl. 356-28.500.
EG&G Chandler Engineering Company: *See—*
Kyker, Robert A., 4,594,877, Cl. 73-4.00D.
Egner-Walter, Bruno: *See—*
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.
Egorova, Eleonora V.: *See—*
Semenov, Pavel A.; Fedorov, Svyatoslav N.; Mironova, Emilia M.; Egorova, Eleonora V.; and Karavaev, Alexandr A., 4,595,017, Cl. 128-733.000.
Ehrhart, Wendell A.: *See—*
Brubaker, Mary A.; Ehrhart, Wendell A.; and Whitmore, William Y., 4,595,626, Cl. 428-220.000.
Eichen, Erwin: *See—*
Allred, David; Eichen, Erwin; and Flasck, James, 4,594,973, Cl. 123-90.400.
Eichhorn, Gunther: *See—*
Kushnick, Steven B.; and Eichhorn, Gunther, 4,594,851, Cl. 60-261.000.

Ejiri, Yoshihiro: *See*—
Tatekura, Koichi; Mochizuki, Kiyofumi; and Ejiri, Yoshihiro, 4,595,284, Cl. 356-73.100.

Eldex Laboratories, Inc.: *See*—
Yotam, Reuben; and Carleton, Joseph G., 4,595,495, Cl. 210-101.000.

Electro-Matic Products Company: *See*—
Armond, Joseph A., 4,595,869, Cl. 318-626.000.

Elf France: *See*—
Estienne, Patrick, 4,595,047, Cl. 165-76.000.

Eli Lilly and Company: *See*—
Atkins, Randall K.; and Weigel, Leland O., 4,595,754, Cl. 546-18.000.
Flom, Merlyn G., 4,595,586, Cl. 424-59.000.

Elitex, koncern textilniho strojirenstvi: *See*—
Muzila, Cyril, 4,594,844, Cl. 57-88.000.

Ellwanger, Russell C., to Signetics Corporation. Method of forming insulator of selectively varying thickness on patterned conductive layer. 4,594,769, Cl. 29-578.000.

Elscint Ltd.: *See*—
Kamil, Zvi; and Lipson, Stephen G., 4,595,900, Cl. 335-299.000.

Eltech Systems Corporation: *See*—
Brannan, James R., 4,595,468, Cl. 204-98.000.
Sane, Ajit Y., 4,595,545, Cl. 264-65.000.

ELXSI: *See*—
McFarland, Harold L., Jr., 4,595,923, Cl. 340-825.520.

Emerson Electric Co.: *See*—
Bowsky, Benjamin, 4,595,557, Cl. 419-49.000.

Emhart Industries, Inc.: *See*—
Hart, Leroy, 4,594,864, Cl. 70-143.000.

Endelson, Robert A., to Microtech Associates. Single-action ultra-thin cigarette lighter. 4,595,352, Cl. 431-254.000.

Endo, Hiroshi, to Uniden Corporation. Automatic sensitivity switching circuit for a cordless telephone. 4,595,795, Cl. 179-2.0EA.

Endo, Kiyonobu: *See*—
Nose, Noriyuki; and Endo, Kiyonobu, 4,595,290, Cl. 356-225.000.

Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, to Tokyo Shibaura Denki Kabushiki Kaisha. Image signal reproduction circuit for solid-state image sensor. 4,595,954, Cl. 358-213.000.

Energy Conversion Devices, Inc.: *See*—
Allred, David; Eichen, Erwin; and Flasck, James, 4,594,973, Cl. 123-90.400.

Enertec: *See*—
Chiffert, Alain; Galula, William; and Rousseau, Michel, 4,595,988, Cl. 364-483.000.

Engdahl, Lennart: *See*—
Andersson, Roger; Engdahl, Lennart; and Klasson, Jan, 4,594,843, Cl. 56-295.000.

Engebretson, Harold J., to Applied Technologies Associates. Borehole surveying employing ring laser gyroscope. 4,594,790, Cl. 33-304.000.

Engel, Gerhard; Engelbrecht, Hans C.; and Wessel, Wolf, to Robert Bosch GmbH. Device for recirculating exhaust gas in an internal combustion engine. 4,594,993, Cl. 123-571.000.

Engelbrecht, Hans C.: *See*—
Engel, Gerhard; Engelbrecht, Hans C.; and Wessel, Wolf, 4,594,993, Cl. 123-571.000.

Engine Monitor, Inc.: *See*—
Cognevich, Kenneth J., Sr.; and Robichaux, Joseph E., Jr., 4,595,867, Cl. 318-588.000.

ENI-Ente Nazionale Idrocarburi: *See*—
Pecci, Giancarlo; Carvani, Luigi; Valentini, Domenico; and Zaninelli, Michele, 4,595,488, Cl. 208-412.000.

Enso-Gutzeit Oy: *See*—
Puumalainen, Pertti, 4,595,840, Cl. 250-572.000.

Envirex Inc.: *See*—
Kormanik, Richard; Dejewski, Karen; and Brummond, Robert, 4,595,499, Cl. 210-202.000.

Enviro-Spray Systems Incorporated: *See*—
Schmidt, Richard; and Pizzo, Joseph A., Sr., 4,594,834, Cl. 53-117.000.

Epple, Anton: *See*—
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.

Equipment Services Ltd.: *See*—
Ruskin, Bryan E. S.; and Lewis, Leonard K., 4,595,131, Cl. 222-640.000.

Erasmus Universiteit Rotterdam: *See*—
Jansen, Jozef R.; and Versprille, Adriaan, 4,595,015, Cl. 128-713.000.

Erdman, J. Gordon, to Phillips Petroleum Company. Composition comprising 1,3,5-trioxane. 4,595,396, Cl. 44-63.000.

Ernst Leitz Wetzlar GmbH: *See*—
Neumann, Burkhard; and Reinheimer, Gunter, 4,595,829, Cl. 250-201.000.

Essef Industries, Inc.: *See*—
LeBreton, Edward T.; Kepler, Arthur M.; and Groves, Clyde W., 4,595,037, Cl. 138-30.000.

Estienne, Patrick, to Elf France. Device for attaching an element for rotation in a tube. 4,595,047, Cl. 165-76.000.

Ethicon, Inc.: *See*—
Mericle, Robert W., 4,595,007, Cl. 128-334.00R.

Ethyl Corporation: *See*—
Nalepa, Christopher J.; Ranken, Paul F.; and Wiegand, Karl E., 4,595,742, Cl. 528-64.000.

Ethylene Corp: *See*—
Johnson, Kirk B., 4,594,903, Cl. 73-863.830.

Ex-Cell-O Corporation: *See*—
Hagemeyer, Kenneth L., 4,594,779, Cl. 30-360.000.

Exxon Research and Engineering Co.: *See*—
Fung, Shun C.; and Tauster, Samuel J., 4,595,669, Cl. 502-74.000.
Ho, Teh C.; and McCandlish, Larry E., 4,595,672, Cl. 502-219.000.
Lee, Wei-Kuo, 4,594,794, Cl. 34-57.00A.
Oswald, Alexis A.; Jermasen, Torris G.; Westner, Andrew A.; and Huang, I-der, 4,595,753, Cl. 546-21.000.
Payne, Virgil L.; and Mauldin, Charles H., 4,595,703, Cl. 518-715.000.
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,595,668, Cl. 502-66.000.
Scouten, Charles G., 4,595,489, Cl. 208-263.000.
Tauster, Samuel J.; Montagna, Angelo A.; Steger, John J.; Fung, Shun C.; and Cross, Virginia R., 4,595,670, Cl. 502-74.000.
Wolfe, Edward I.; Wasserstrom, David H.; and Kilpert, Richard, 4,595,508, Cl. 210-631.000.

Eydelman, Alexander: *See*—
Ziegler, Theodore J.; Eydelman, Alexander; Koether, Frederick G.; and Lawrance, Robert A., 4,594,824, Cl. 52-118.000.

Fafflok, Friedrich; and Stangl, Horst, to Stangl & Vogt GmbH & Co. KG, Firma. Device for the storage and/or carriage of sensitive materials. 4,595,113, Cl. 220-23.830.

Fairbank, William M.: *See*—
Smith, Todd I.; McAshan, Michael S.; and Fairbank, William M., 4,595,899, Cl. 335-216.000.

Fantuzzi, Joseph D.: *See*—
Anderson, Walter F., Jr.; Sabo, Brian D.; Poulo, Louis R.; Wissmuller, Jan; and Fantuzzi, Joseph D., 4,595,958, Cl. 358-296.000.

Farrall, George A., to General Electric Company. Synchronously operable electrical current switching apparatus. 4,595,855, Cl. 310-332.000.

Favaloro, Caesar J.: *See*—
Cease, Richard G.; Favaloro, Caesar J.; and Hackendorf, James G., 4,596,026, Cl. 375-118.000.

Fay, Ralph M., to Manville Corporation. Process for producing glass fiber products and resulting product. 4,595,630, Cl. 428-288.000.

Fazio, Michael J., to Dow Chemical Company, The. Preparation of ion-exchange catalysts. 4,595,704, Cl. 521-31.000.

Fazzolare, Richard D.; and Windmuller, Rudolf, to Nabisco Brands, Inc. Crackers having stabilized sunflower seeds. 4,595,596, Cl. 426-549.000.

Federal Signal Corporation: *See*—
Gosswiller, Earl W.; and Ritter, G. Thomas, 4,595,904, Cl. 340-87.000.

Fedorov, Svyatoslav N.: *See*—
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Reist, Walter, 4,595,192, Cl. 271-184.000.

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Bhatt, Vipul J.; Mann, Alan B.; and Coe, Stanley S., 4,595,255, Cl. 350-96.200.

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Marino, Joseph A.; Puetz, Peter A.; Kling, Michael J.; Finn, Curtis A.; Pendell, John C.; and Crawford, Michael C., 4,594,789, Cl. 33-288.000.
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Kirman, Richard G.; and Langdon, Roger M., 4,594,898, Cl. 73-778.000.
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Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,595,875, Cl. 324-73.0PC.
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Dean, John R., 4,595,971, Cl. 362-345.000.
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Fladlien, David G., to ITP, Inc. Support mechanism utilizing flexual pivots. 4,595,257, Cl. 350-255.000.
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Flom, Merlyn G., to Eli Lilly and Company. Moisturizing lotion. 4,595,586, Cl. 424-59.000.
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FMC Corporation: *See—*
Crea, David A.; Robertson, James A.; and Keely, Jerry A., 4,595,492, Cl. 209-2.000.
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Focke, Heinz, 4,594,962, Cl. 118-221.000.
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Planchamp, Claude, 4,595,559, Cl. 420-528.000.
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De Luca, Robert D.; and Forbes-Jones, Robin M., 4,595,598, Cl. 427-2.000.
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Ford Motor Company: *See—*
Chattha, Mohinder S., 4,595,761, Cl. 546-263.000.
Jones, James H., 4,595,542, Cl. 261-53.000.
Ma, Thomas T., 4,594,972, Cl. 123-90.240.
McCarthy, Shaun L., 4,594,889, Cl. 73-204.000.
Patil, Prabhakar B., 4,595,880, Cl. 324-427.000.
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Dickson, Richard A.; and Forrester, Allen H., 4,595,351, Cl. 425-114.000.
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Holeman, James E., 4,596,014, Cl. 371-49.000.
Wolowodiuk, Walter, 4,594,967, Cl. 122-4.00D.
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Fox, Charles S. Actuating shaft assembly. 4,595,233, Cl. 297-69.000.
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Francois, Obrecht: *See—*
Van Damme, Henri; Fripiat, Jose J.; Nijs, Hubert; Marceau, Philippe; and Francois, Obrecht, 4,595,568, Cl. 422-186.000.
Frank, James P.; and King, James L., to General Electric Company. Method of assembling a switch and terminal assembly to an end frame for a dynamoelectric machine. 4,594,773, Cl. 29-622.000.
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Frazier, John P.; McComber, Donald R.; and Nichols, Gerhard D., to Gates Rubber Company, The. V-belt. 4,595,387, Cl. 474-201.000.
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Freeman, Janet E.: *See—*
Du Pont, Preston S.; Freeman, Janet E.; Ritter, Robert E.; and Wittmann, Alois, 4,595,623, Cl. 428-195.000.
Freimiller, Gary L.: *See—*
Tyrell, John A.; and Freimiller, Gary L., 4,595,733, Cl. 525-462.000.
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Frenco Verzahnungslehren GmbH: *See—*
Och, Rudolf, 4,594,762, Cl. 29-281.400.
Frentzel, Richard L.; and Rosin, Michael L., to Olin Corporation. Process for using selected fatty acid adducts of a 1,2,4-triazole as sizing or waterproofing agents for cellulosic materials. 4,595,458, Cl. 162-158.000.
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Van Damme, Henri; Fripiat, Jose J.; Nijs, Hubert; Marceau, Philippe; and Francois, Obrecht, 4,595,568, Cl. 422-186.000.
Froutzis, Andrew; and Prathaftakis, George. Means for removably anchoring vehicle seats. 4,595,164, Cl. 248-429.000.
FSI Corporation: *See—*
Schumacher, David D., 4,595,222, Cl. 294-16.000.
Fuhrer, Walter: *See—*
Riniker, Bernhard; Buhlmayer, Peter; and Fuhrer, Walter, 4,595,677, Cl. 514-17.000.
Fuji Photo Film Co., Ltd.: *See—*
Furutachi, Nobuo; Morigaki, Masakazu; and Hirose, Takeshi, 4,595,650, Cl. 430-387.000.
Nakamura, Taku; Hibino, Akira; and Hirai, Hiroyuki, 4,595,652, Cl. 430-559.000.
Fuji Seal Industry Co.: *See—*
Maruyama, Hisao; Kitajima, Masahiko; and Matsubara, Tsutomu, 4,595,544, Cl. 264-46.500.
Fuji Xerox Co., Ltd.: *See—*
Satoh, Takane, 4,596,025, Cl. 375-107.000.
Fujibayashi, Kazuo: *See—*
Yamada, Yasuyuki; Fujibayashi, Kazuo; Sato, Yasuhisa; and Yokota, Hideo, 4,595,270, Cl. 354-222.000.
Fujihisa, Hiroaki: *See—*
Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, 4,595,895, Cl. 335-26.000.
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Fujii, Kenji: *See—*
Ohki, Hiroshi; Fujii, Kenji; Ogawa, Hidehiro; and Takahama, Akio, 4,595,294, Cl. 356-375.000.
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Fujimura, Kazushiro; and Mizuno, Kazuyoshi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus of learning control for air/fuel ratio of an internal combustion engine to avoid sticking to lean or rich side operation. 4,594,985, Cl. 123-489.000.

Fujioka, Satoshi, to Seiko Epson Corporation. Hammer assembly for printers. 4,595,304, Cl. 400-157.200.

Fujise, Taisuke: *See—*
Katagiri, Kunio; Arimura, Joji; Kondo, Kazuo; and Fujise, Taisuke, 4,595,059, Cl. 166-290.000.

Fujita, Akihisa, to Mitsubishi Jukogyo Kabushiki Kaisha. Controller for cutting sheet material. 4,594,923, Cl. 83-74.000.

Fujitsu Limited: *See—*
Baba, Fumio, 4,596,001, Cl. 365-189.000.
Sorimachi, Haruo; Satoh, Kiyoshi; and Suzuki, Takumi, 4,595,823, Cl. 219-216.000.

Fukase, Hiroshi: *See—*
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,595,678, Cl. 514-53.000.

Fukatsu, Yoshiaki; Kurahashi, Takashi; and Matsui, Kazuma, to Nippondenso Co., Ltd. Windshield wiper control apparatus. 4,595,866, Cl. 318-444.000.

Fukazawa, Takao: *See—*
Itoh, Tadashi; Murai, Toshiharu; Jinnai, Koichiro; Ishima, Kazumi; Koike, Takahisa; Kato, Toshifumi; and Fukazawa, Takao, 4,595,948, Cl. 358-75.000.

Fukui, Izumu: *See—*
Yano, Takeshi; Hori, Shinichi; Fukui, Izumu; Sato, Eiichi; and Inui, Osamu, 4,595,854, Cl. 310-317.000.

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Tanzawa, Misao; Saito, Kinzi; and Fukushima, Ichiro, 4,595,280, Cl. 355-15.000.

Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, to Toyota Jidosha Kabushiki Kaisha. Apparatus and method for plasma treatment of resin material. 4,595,570, Cl. 422-186.050.

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Cohen, Sidney M., 4,595,416, Cl. 106-100.000.

Fullerton, Larry: *See—*
Driver, R. Byron; and Fullerton, Larry, 4,596,023, Cl. 375-55.000.

Fung, Shun C.; and Tauster, Samuel J., to Exxon Research and Engineering Co. Method of preparing an improved catalyst. 4,595,669, Cl. 502-74.000.

Fung, Shun C.: *See—*
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,595,668, Cl. 502-66.000.
Tauster, Samuel J.; Montagna, Angelo A.; Steger, John J.; Fung, Shun C.; and Cross, Virginia R., 4,595,670, Cl. 502-74.000.

Funk, Edward W.: *See—*
Chang, Y. Alice; Kulkarni, Sudhir S.; and Funk, Edward W., 4,595,507, Cl. 210-638.000.

Funk, Walter G.: *See—*
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,595,668, Cl. 502-66.000.

Funke, Siegfried: *See—*
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,595,531, Cl. 260-239.0BD.

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Futaba Denshi Kogyo K.K.: *See—*
Morimoto, Kiyoshi; Watanabe, Hiroshi; Tsuruoka, Yoshihisa; and Shimizu, Yukihiko, 4,595,862, Cl. 315-169.400.

G. D. Searle & Co.: *See—*
Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., 4,595,700, Cl. 514-616.000.

G.D Societa' per Azioni: *See—*
Mattei, Riccardo, 4,595,026, Cl. 131-109.100.

Gabbay, Emile, to Thomson-CSF. General purpose X-ray tube for stereography. 4,596,028, Cl. 378-41.000.

Gabbert, James D.; and Hedrick, Ross M., to Monsanto Company. Promotion of ϵ-caprolactam polymerization with lactam magnesium halide catalyst and 2-oxo-1-pyrrolidinyl groups. 4,595,746, Cl. 528-312.000.

Gabbert, James D., to Monsanto Company. Viscosified lactam polymerization initiator solutions. 4,595,747, Cl. 528-319.000.

Gable, Ronald L.: *See—*
Appenzeller, Robert C.; Bailey, Curtis R.; and Gable, Ronald L., 4,594,771, Cl. 29-596.000.

Gaiser, Robert F., to Allied Corporation. Deceleration and pressure sensitive proportioning valve. 4,595,243, Cl. 303-6.00C.

Galbiati, Mauro. Filter for purifying drinkable and non-drinkable water. 4,595,500, Cl. 210-266.000.

Galik, George M. Liquid-liquid extractor and method for using same. 4,595,571, Cl. 422-259.000.

Gallagher, Hugh M., Jr., to Consolidated Metal Products, Inc. Anchor bolt assembly. 4,595,315, Cl. 405-261.000.

Gallagher, Steve: *See—*
Carter, Kelly; Gallagher, Steve; Iverson, Gregory; and Krechmer, Kenneth R., 4,596,021, Cl. 375-5.000.

Galligan, William L.: *See—*
Pellerin, Roy F.; Galligan, William L.; and Eberle, George F., 4,594,900, Cl. 73-806.000.

Galula, William: *See—*
Chiffert, Alain; Galula, William; and Rousseau, Michel, 4,595,988, Cl. 364-483.000.

Game Tracker, Inc., The: *See—*
Rezmer, Leonard D., 4,594,786, Cl. 33-180.00R.

Gamou, Yutaka: *See—*
Nishiyama, Ryota; Amano, Masahiro; Seino, Shunji; Gamou, Yutaka; and Kawakami, Hidenori, 4,595,457, Cl. 162-123.000.

Gandini, Marco; and Trevisan, Dante, to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A. Unit cell for integrated-circuit gate arrays. 4,595,940, Cl. 357-42.000.

Ganguli, Partha S., to HRI, Inc. Catalyst rejuvenation process for removal of metal contaminants. 4,595,666, Cl. 502-26.000.

Gaponenko, Olga S.: *See—*
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.

Garber & Hedges Incorporated: *See—*
Hedges, Kenneth, 4,595,147, Cl. 241-55.000.

Garin, Gert: *See—*
Winbladh, Per; and Garin, Gert, 4,595,510, Cl. 210-776.000.

Garner, Ronald S., Sr. Cable or rope connection including clamp device. 4,594,752, Cl. 24-132.00R.

Garrecht, Robert J.: *See—*
Knepper, J. Irvine; Garrecht, Robert J.; and Dear, George W., 4,595,523, Cl. 252-390.000.

Garrelfs, Peter A.; and Young, Walter H., to Pendell Boiler Limited. Forced draft burner. 4,595,355, Cl. 431-265.000.

Garrett Corporation, The: *See—*
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., 4,594,848, Cl. 60-39.020.

Garrison, Brian E.: *See—*
Hellman, Goran; and Garrison, Brian E., 4,595,504, Cl. 210-519.000.

Garrison, John D. Carbonaceous selective absorber for solar thermal energy collection and process for its formation. 4,594,995, Cl. 126-417.000.

Garteiz, Daniel: *See—*
Mardi, Shalva; Lichti, Heinz F.; Baumgartner, Guido; Garteiz, Daniel; Judd, Claude I.; and Weiner, Murray, 4,595,591, Cl. 424-127.000.

Garwin, Leo: *See—*
Brown, Roy N.; Stout, Mike F.; Hagen, Arnulf P.; and Garwin, Leo, 4,595,599, Cl. 427-5.000.

Garwin, Richard L.; and Levine, James L., to International Business Machines Corporation. Eye controlled information transfer. 4,595,990, Cl. 364-518.000.

Gater, Robert; and Pass, Peter A., to Service (Engineers) Limited. Trimming ceramic flatware. 4,594,768, Cl. 29-564.000.

Gates, Allen P.: *See—*
Stanton, Michael; Gates, Allen P.; and Potts, Rodney M., 4,595,648, Cl. 430-162.000.

Gates Rubber Company, The: *See—*
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Gaudreau, Gregory J.: *See—*
Hagstrom, David R.; and Gaudreau, Gregory J., 4,595,197, Cl. 272-127.000.

Gausmann, Eric J.: *See—*
Beckner, Mark W.; Davis, James A.; Gausmann, Eric J.; Hiller, Thomas L.; Olson, Philip D.; and Van Dine, Gilbert A., 4,596,010, Cl. 370-60.000.

Gautier, Jean-Claude: *See—*
Tellier, Jacques; and Gautier, Jean-Claude, 4,595,512, Cl. 252-8.55C.

Gautier, Jean-Pierre: *See—*
Le Marchand, Claude; and Gautier, Jean-Pierre, 4,595,085, Cl. 188-71.900.

Gaysert, Gerhard; Gerwin, Reinhard; and Gotz, Dieter, to J. Eberspacher. Burner construction for air heaters using an ultrasonic atomizer. 4,595,356, Cl. 431-352.000.

Geberit AG: *See—*
Gebert, Stephan, 4,594,738, Cl. 4-199.000.

Gebert, Stephan, to Geberit AG. Drain and overflow device for bathtubs. 4,594,738, Cl. 4-199.000.

Gebruder Weiss K.G.: *See—*
Kneer, Franz X., 4,595,506, Cl. 210-609.000.

Geen, John A., to British Aerospace Public Limited Company. Detection of movement of a cyclic interference waveform, such as in a ring laser gyroscope. 4,595,293, Cl. 356-350.000.

Gehalo, David J.; and Fisher, Thomas M., to Reliance Electric Company. Central office powered credit only telephone paystation. 4,595,983, Cl. 364-401.000.

GEHL Company: *See—*
Viesselmann, Kim P., 4,595,318, Cl. 406-97.000.

Gehman, John B., to General Dynamics Electronics. Intruder detection radar system and automatic nulling antenna array. 4,595,924, Cl. 343-5.0PD.

Geiger, Rolf; Teetz, Volker; Scholkens, Bernward; and Wissmann, Hans, to Hoechst Aktiengesellschaft. Bicyclic α-iminocarboxylic acid compounds having hypotensive activity. 4,595,675, Cl. 514-10.000.

GenCorp Inc.: *See—*
Bogdany, John, 4,595,617, Cl. 428-95.000.

General Dynamics Electronics: *See—*
Gehman, John B., 4,595,924, Cl. 343-5.0PD.

General Dynamics, Pomona Division: *See—*
Alexandris, George, 4,594,945, Cl. 102-287.000.

General Electric Company: *See*—
Anthony, Thomas R.; Houston, Douglas E.; and Loughran, James A., 4,595,428, Cl. 148-187.000.
Bell, Gordon M.; and Ridlen, James R., 4,595,616, Cl. 428-68.000.
Brunelle, Daniel J., 4,595,760, Cl. 546-256.000.
Dunki-Jacobs, Robert J., 4,596,048, Cl. 455-602.000.
Farrall, George A., 4,595,855, Cl. 310-332.000.
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,595,729, Cl. 525-147.000.
Frank, James P.; and King, James L., 4,594,773, Cl. 29-622.000.
Jahns, Thomas M., 4,595,865, Cl. 318-254.000.
Klassen, David D.; and Ballantyne, Douglas B., 4,595,340, Cl. 416-193.00A.
Manueco Santurtun, Carlos; and Diaz Carmena, Angel, 4,596,029, Cl. 378-105.000.
Murphy, Guy C.; Jones, Jackie D.; and Salemme, Charles T., 4,594,761, Cl. 29-156.80R.
Ryang, Hong-Son, 4,595,732, Cl. 525-417.000.
Sederel, Willem L.; and van Abeelen, Petrus C. A. M., 4,595,633, Cl. 428-412.000.
Snow, Barton H.; and Stockton, William W., 4,594,852, Cl. 60-38.281.
Tyrell, John A.; and Freimiller, Gary L., 4,595,733, Cl. 525-462.000.
White, Dwain M., 4,595,773, Cl. 556-110.000.

General Research Corporation: *See*—
Gordon, James H., 4,595,908, Cl. 340-347.0SH.

Gentric, Alain. Optical fiber collimating system. 4,595,254, Cl. 350-96.180.

Georg Fischer AG: *See*—
Ottowell, Rudiger, 4,595,090, Cl. 198-346.200.

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Duval, Ernest H.; and Nigro, Louis V., 4,595,124, Cl. 222-39.000.

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Patzschke, Hans-Peter; Gobel, Armin; and Klein, Klausjorg, 4,595,717, Cl. 523-414.000.

Gober, Benjamin G. Tree climbing apparatus. 4,595,076, Cl. 182-136.000.

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Goetz, Harold E. Paper roll holder. 4,595,153, Cl. 242-55.300.

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Goldstein, Edward J., to Padco, Inc. Universal hinge-type joint. 4,594,816, Cl. 51-393.000.

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Gonzalez, Cesar, to Cessna Aircraft Company, The. Hybrid internal combustion reciprocating engine. 4,594,976, Cl. 123-260.000.

Good, Maynard L. Apparatus and method for loading plastic tubing with bales. 4,594,836, Cl. 53-459.000.

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Baasch, Holger J.; Goodman, Douglas S.; Luecke, Francis S.; Soderstrom, Ronald L.; and Spiller, Eberhard A., 4,595,261, Cl. 350-394.000.

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Grataloup, Xavier R., to J. I. Case Company. Regularizing device for the depth of a furrow. 4,594,951, Cl. 111-85.000.

Graver, Ronald N., to AT&T Bell Laboratories. Plastic package with lead frame crossunder. 4,595,945, Cl. 357-70.000.

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Livesay, Richard E.; and Grawey, Charles E., 4,594,846, Cl. 59-5.000.

Gray, Charles R., to H. H. Robertson Company. Field-assembled raceway forming member. 4,594,826, Cl. 52-221.000.

Gray, Edwin V., Sr. Efficient power supply suitable for inductive loads. 4,595,975, Cl. 363-33.000.

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Greco Bros., Inc.: *See*—
Greco, Ralph C., 4,595,474, Cl. 204-232.000.

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Greene, Tammie B.; Townsend, David E.; and Perfetti, Thomas A., to R. J. Reynolds Tobacco Company. Segmented cigarette. 4,595,024, Cl. 131-77.000.

Greenhalgh, Wilbur O., to United States of America, Energy. Process for immobilizing radioactive boric acid liquid wastes. 4,595,528, Cl. 252-629.000.

Greenway, William E. Fall arrest device for pole climbers. 4,595,078, Cl. 182-9.000.

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Dubois, Robert A., 4,595,112, Cl. 220-5.00R.

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Groeing, Robert E. Fruit bin trailer. 4,595,210, Cl. 280-43.230.

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Hombach, Rudolf; Dollhausen, Manfred; Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Reischl, Artur, 4,595,445, Cl. 156-307.300.

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LeBreton, Edward T.; Kepler, Arthur M.; and Groves, Clyde W., 4,595,037, Cl. 138-30.000.

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Brunelli, Timothy A.; and Landmesser, Keith E., 4,595,412, Cl. 75-0.5BB.

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Guerra, Romeo E. Igniter for gas discharge pipe with a flame detection system. 4,595,354, Cl. 431-264.000.

Guggiari, Roy S., to Butlers Ltd. Mounting bracket for securing a lamp to a motor vehicle. 4,595,163, Cl. 248-229.000.

Guibert, Raul, to Sunset Ltd. Localized thermotherapy technique. 4,595,008, Cl. 128-399.000.

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Gunderson, Wayne D.: *See*—
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Gundlach, Robert W. Electrostatic generator. 4,595,852, Cl. 310-309.000.

Gunnerson, Robert E.; and Jue, Gary, to Sun-Diamond Growers of California. Process for simultaneous roasting of nutmeats and pellicle removal. 4,595,595, Cl. 426-438.000.

Gunther, Arnold. Process and apparatus for ventilation with heat exchange. 4,594,855, Cl. 62-92.000.

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Gurnett, Keith W.: *See*—
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Hacias, Kenneth J., to Parker Chemical Company. Method of forming phosphate coating on zinc. 4,595,424, Cl. 148-6.15R.

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Haga, Toru; Nagano, Eiki; Yoshida, Ryo; and Hashimoto, Shunichi, to Sumitomo Chemical Company, Ltd. Substituted phenyl-4,5,6,7-tetrahydro-2H-isoindole-1,3-diones, and their production and use. 4,595,409, Cl. 71-96.000.

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Hagemeister, Robert C., to Webster Spring Co. Inc. Bent wire spring unit. 4,595,181, Cl. 267-103.000.

Hagemeyer, Kenneth L., to Ex-Cell-O Corporation. Punch and die adapter. 4,594,779, Cl. 30-360.000.

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Hagstrom, David R.; and Gaudreau, Gregory J. Wheeled exercise device. 4,595,197, Cl. 272-127.000.

Hague, James G. Panel support assembly for concealed fastener roof structure. 4,594,823, Cl. 52-90.000.

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Hahn, Roger A., to Adolph Coors Company. Injection mold gate apparatus. 4,595,552, Cl. 264-328.100.

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Hakaridani, Mitsuhiro; Nishioka, Yoshiki; and Iwahashi, Hiroyuki, to Sharp Kabushiki Kaisha. Method of speech recognition. 4,596,031, Cl. 381-43.000.

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Hakim, Salomon; and Hakim, Carlos A. Magnetically-adjustable cerebrospinal fluid shunt valve. 4,595,390, Cl. 604-9.000.

Hakky, Said I. Self actuated penile implant. 4,594,997, Cl. 128-79.000.

Hale, John R., to RCA Corporation. Reinforcing means for a cup-shaped electron gun electrode. 4,595,858, Cl. 313-414.000.

Halen, Lars, to Asea AB. Metal melting and melt heat retaining furnace. 4,596,020, Cl. 373-161.000.

Hall, Randy W.: *See*—
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Hall, Richard L.; Jenniches, Frieda S.; Kehoe, James R.; Strong, David G.; and Silcott, Edward N., to Westinghouse Electric Corp. Automated soldering process and apparatus. 4,595,816, Cl. 219-121.0LD.

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Haluska, Loren A., to Dow Corning Corporation. Silicon carbide preceramic vinyl-containing polymers. 4,595,472, Cl. 522-99.000.

Hamada, Masa: *See*—
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Hamanaka, Ernest S., to Pfizer Inc. Preparation of penem derivatives and azetidinone intermediates. 4,595,539, Cl. 260-239.00A.

Hamanaka, Toshiyuki: *See*—
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Hamazaki, Yuuji: *See*—
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Hamou, Jacques. Tubular pessary as a contraceptive means. 4,595,000, Cl. 128-130.000.

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Hanchett, Leland J., Jr.; and Lawrence, Mark A., 4,595,220, Cl. 292-341.170.

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Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; Wiatrak, Thomas R.; and Curran, Neal J., to Invacare Corporation. Folding sports wheelchair. 4,595,212, Cl. 280-242.0WC.
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Henderson, Dewey D., to Dayco Corporation. Belt construction, transverse belt element therefor and method of making the same. 4,595,385, Cl. 474-201.000.
Henderson, Gene. Vent valves for prosthetic devices. 4,595,172, Cl. 251-321.000.
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Herstein, Barry S., to Buddy L Corporation. Toy packaging. 4,595,097, Cl. 206-335.000.
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Heston, Scott. Power take-off system for marine engines. 4,595,371, Cl. 440-75.000.
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Miller, Brian M., 4,595,888, Cl. 332-18.000.
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Heyden, Eugene L. Retractable implement closure. 4,595,307, Cl. 401-117.000.
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Schmidt, Paul J.; and Crounse, Nathan N., 4,595,768, Cl. 549-307.000.
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Hodges, Richard P. Cursor control support device. 4,595,070, Cl. 180-125.000.
Hodgins, Diana M.; and Homewood, George J. R., to British Aerospace Public Limited Company. Heat transfer arrangement. 4,594,862, Cl. 62-417.000.
Hodgson, R. W.; and Barham, Herbert D. Portable field inspection microscope for inspecting a butt end of a cylindrical object, such as a fiber optics cable. 4,595,265, Cl. 350-523.000.
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Crass, Gunther; Bothe, Lothar; Janocha, Siegfried; and Dietz, Wolfgang, 4,595,625, Cl. 428-215.000.
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Hoehn, Wolfgang, to ITT Industries, Inc. Integrated circuit for generating a terminal voltage adjustable by a digital signal. 4,595,912, Cl. 340-347.0DA.
Hoffman, Simon J. Holder for saber saw blade. 4,594,781, Cl. 30-392.000.
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Baggiolini, Enrico G.; Batcho, Andrew D.; Boris, Alfred; and Uskokovic, Milan R., 4,595,776, Cl. 556-436.000.
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Holmes, William A. Portable water container with easily-replaceable liner. 4,595,126, Cl. 222-105.000.
Holstedt, Richard A.; and Croudace, Michael C., to Union Oil Company of California. Boron-containing heterocyclic compound and lubricating compositions containing same. 4,595,514, Cl. 252-46.400.
Holstein, John H.; McCarty, Robert C.; and Parrish, Walter G. Burst fire control mechanism. 4,594,934, Cl. 89-129.020.
Holthusen, Bernd, to Dr. Boger Photosatz GmbH. Optical light bead scanning arrangement. 4,595,957, Cl. 358-290.000.
Holvoet, Marcel; Mitrani, Sem; and Pigneul, Raymond, to Beghin-Say S.A. Fabrication method for disposable articles and a liquid-absorbing disposable article. 4,595,441, Cl. 156-265.000.
Holz, George E.; and Ogle, James A., to Burroughs Corporation. System and method for operating a display panel having memory. 4,595,919, Cl. 340-793.000.
Holzer, Helmut, to Carl Freudenberg, Firma. Seal with inner and outer slidably contacting rings. 4,595,206, Cl. 277-25.000.
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Yaguchi, Tadahiro, 4,595,841, Cl. 290-1.00A.
Honeywell Inc.: *See*—
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Hong, Johnstom. Pencil with sharpener. 4,595,306, Cl. 401-50.000.
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Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, to Takeda Chemical Industries, Ltd. N-substituted pseudo-aminosugars and pharmaceutical compositions containing same. 4,595,678, Cl. 514-53.000.
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Houben, Jan P.; and Moolenaar, Antonie J., to Skil Nederland B.V. Commutator motor and improved brush construction for use in portable machine tools. 4,595,851, Cl. 310-246.000.
Houck, Jasper C., Jr. Air towel. 4,594,797, Cl. 34-225.000.
Houston, Douglas E.: *See*—
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Hoxmeier, Ronald J., to Shell Oil Company. Direct removal of NI catalysts. 4,595,749, Cl. 528-483.000.
HRI, Inc.: *See*—
Ganguli, Partha S., 4,595,666, Cl. 502-26.000.
Hrusch, Louis C., to Pneumo Corporation. Landing gear mechanism including runway-roughness restrictor assembly. 4,595,159, Cl. 244-104.0FP.
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Huber, Anton; and Tihanyi, Jeno , to Siemens Aktiengesellschaft. For the protection of an MOS-transistor from overloading. 4,595,966, Cl. 361-93.000.
Huber, Gerhard: *See*—
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Huffman, Charles E.; and Southerland, Stephen R., to Rockwell International Corporation. PCM data translating apparatus. 4,595,907, Cl. 340-347.0DD.
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LeCompte, George W., 4,595,258, Cl. 350-272.000.
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Hung, William M.; and Knox, Jack M., to Hilton-Davis Chemical Co., The. Triphenylmethane dyestuff. 4,595,536, Cl. 260-394.000.
Hurley, Kenneth L.: *See*—
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Hurt, Charles F. Method and apparatus for water distillation with energy recovery. 4,595,460, Cl. 203-21.000.
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Hutson, Roy C. Three-position, four-way, short-stroke rotary valve. 4,595,034, Cl. 137-625.210.
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Huynh, Tam H., to Intergraph Corporation. Hidden panel connector. 4,595,115, Cl. 220-337.000.
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Ibrahim, Adel A.; Linville, Kevin D.; and Mays, Jerry E. Method for removing objects from tubular body passages. 4,594,996, Cl. 128-1.00R.
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Ide, Hiroshi, to Tokyo Juki Industrial Co. Ltd. Presser foot lift device for a top feed sewing machine. 4,594,958, Cl. 112-320.000.
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Iino, Takashi, to Taisei Kogyo Co., Ltd. Control apparatus for heat exchanger. 4,595,046, Cl. 165-39.000.
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Ikeda, Hideaki. Surface-chiseling machine. 4,594,759, Cl. 29-81.00D.
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Imamura, Takumi, to Nihon Kuatsu System Corp., Ltd. Pressure detecting apparatus. 4,594,881, Cl. 73-37.500.
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Reckel, Rudolph P.; Harris, Joanne L.; Wellerson, Ralph, Jr.; Shaw, Sally M.; and Kaplan, Paul M., 4,595,654, Cl. 435-7.000.
Imperial Chemical Industries PLC: *See*—
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Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,595,406, Cl. 71-076.000.
Imperial Clevite Inc.: *See*—
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Industrie Pirelli S.p.A.: *See*—
Tangorra, Giorgio; and Robecchi, Edoardo, 4,595,167, Cl. 248-638.000.
Tangorra, Giorgio, 4,595,388, Cl. 474-204.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Conta, Renatol; and Manini, Enrico, 4,595,937, Cl. 346-140.00R.
Conta, Renatol; and Manini, Enrico, 4,595,938, Cl. 346-140.00R.
Innes, John G., to International Business Machines Corp. Interactive data processing system having concurrent multi-lingual inputs. 4,595,980, Cl. 364-200.000.

Inoue, Akira: *See*—
Takase, Shinji; Inoue, Akira; Omata, Tatuo; Mori, Masao; Yamazaki, Yoshihiro; and Kubo, Tatsuki, 4,595,667, Cl. 502-63.000.
Inoue, Chikara: *See*—
Kimura, Kazuo; Sakai, Kunihide; Inoue, Chikara; Hayashi, Hiroyuki; Takayasu, Toyoaki; Ayabe, Yasuhiro; and Miyake, Kayoko, 4,595,964, Cl. 360-125.000.
Inouye, Tohru; and Tong, Lai-Chun J., to Syprocode, Inc. Capsule and clamping apparatus for locating and embedding a specimen and a method for using the same. 4,595,549, Cl. 264-267.000.
Institut Francais du Petrole: *See*—
Degobert, Paul; Maute, Michel; and Banet, Gerald, 4,594,968, Cl. 123-1.00A.
Institut fur Kerntechnik und Energiewandlung e.V.: *See*—
Koch, Dieter, 4,595,819, Cl. 219-121.0EB.
Instrumentarium Corp.: *See*—
Rantala, Borje, 4,595,018, Cl. 128-733.000.
Intergraph Corporation: *See*—
Huynh, Tam H., 4,595,115, Cl. 220-337.000.
InterMetro Industries Corp.: *See*—
Welsch, John H., 4,595,107, Cl. 211-187.000.
International Business Machines Corporation: *See*—
Antipov, Igor, 4,595,944, Cl. 357-51.000.
Baasch, Holger J.; Goodman, Douglas S.; Luecke, Francis S.; Soderstrom, Ronald L.; and Spiller, Eberhard A., 4,595,261, Cl. 350-394.000.
Bouchard, Donald R.; Danton, John L.; Dawson, Kevin A.; and Sloma, David J., 4,596,037, Cl. 382-8.000.
Chan, Yuen H.; Jones, Frank D.; and Stinson, William F., 4,596,002, Cl. 365-189.000.
Garwin, Richard L.; and Levine, James L., 4,595,990, Cl. 364-518.000.
Giammarco, Nicholas J.; and Kaplita, George A., 4,595,484, Cl. 204-298.000.
Innes, John G., 4,595,980, Cl. 364-200.000.
Kaufman, Dan R., 4,596,004, Cl. 365-233.000.
Mitchell, Joan L.; and Anderson, Karen L., 4,596,039, Cl. 382-56.000.
Sharon, Andre, 4,595,334, Cl. 414-735.000.
Simpson, Robert A., 4,595,836, Cl. 250-491.100.
Wiedmann, Siegfried K., 4,596,000, Cl. 365-174.000.
Wilczynski, Janusz S., 4,595,295, Cl. 356-401.000.
International Dodge, Inc.: *See*—
Dodge, Cleveland E., Jr.; and Stafford, Lawrence R., 4,595,174, Cl. 254-391.000.
International Flavors & Fragrances Inc.: *See*—
Mookherjee, Braja D.; and Trenkle, Robert W., 4,595,525, Cl. 252-522.00R.
International Paper Company: *See*—
Quick, James R.; Golden, Craig A.; and Mitchell, James W., 4,595,611, Cl. 428-35.000.
International Rolling Mill Consultant, Inc.: *See*—
Ginzburg, Vladimir B., 4,595,358, Cl. 432-65.000.
International Standard Electric Corporation: *See*—
Wright, Stephen; and Couch, Philip R., 4,596,052, Cl. 455-619.000.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Hufnagel, Walter; and Vates, Heinz, 4,595,738, Cl. 526-348.100.
Interox (Societe Anonyme): *See*—
Stas, Georges; and Biver, Christian, 4,595,577, Cl. 423-245.000.
Interplastic Corporation: *See*—
O'Hearn, Thomas P., 4,595,734, Cl. 525-524.000.
Intersil, Inc.: *See*—
Bingham, David, 4,595,906, Cl. 340-347.0NT.
Inui, Osamu: *See*—
Yano, Takeshi; Hori, Shinichi; Fukui, Izumu; Sato, Eiichi; and Inui, Osamu, 4,595,854, Cl. 310-317.000.
Inui, Yoshiharu: *See*—
Matsumura, Takahiro; and Inui, Yoshiharu, 4,595,162, Cl. 248-68.100.
Invacare Corporation: *See*—
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; Wiatrak, Thomas R.; and Curran, Neal J., 4,595,212, Cl. 280-242.0WC.
Ishibashi, Kazuhisa: *See*—
Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,595,326, Cl. 413-1.000.
Ishihara, Koji: *See*—
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, 4,595,664, Cl. 501-124.000.
Ishii, Hiroshi, to Casio Computer Co., Ltd. Electronic musical instrument for reading out and performing musical tone data previously stored. 4,594,931, Cl. 84-1.030.
Ishii, Koichi: *See*—
Takeno, Tadayoshi; Ishii, Koichi; Yamane, Koichi; Kita, Kazuo; Iwasaki, Toshio; and Hirase, Koichi, 4,595,519, Cl. 252-146.000.
Ishikawa, Kiichiro, to Yoshida Kogyo K. K. Apparatus for cutting a slide fastener chain. 4,594,925, Cl. 83-209.000.
Ishikawa, Masakazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Banjo type axle casing. 4,594,912, Cl. 74-607.000.
Ishikawa, Nobuo: *See*—
Murakami, Takeomi; and Ishikawa, Nobuo, 4,595,417, Cl. 106-309.000.
Ishima, Kazumi: *See*—
Itoh, Tadashi; Murai, Toshiharu; Jinnai, Koichiro; Ishima, Kazumi; Koike, Takahisa; Kato, Toshifumi; and Fukazawa, Takao, 4,595,948, Cl. 358-75.000.
Ishino, Masaru: *See*—
Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, 4,595,701, Cl. 518-701.000.
Ishizuka, Hiroshi. Chlorinator furnace and method for producing tetrachloride of such metals as titanium and zirconium. 4,595,573, Cl. 423-76.000.
Ishizuka, Masaaki: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,595,698, Cl. 514-565.000.
Ishmael, John, to United States of America, Army. Cable stripping apparatus. 4,594,921, Cl. 81-9.400.
Israel, Mrs. Lawrence: *See*—
Close, Leo R., 4,595,915, Cl. 340-572.000.
Itazaki, Hiroshi; Hayashi, Kunio; Matsuura, Munenori; Yonetani, Yukio; and Nakamura, Masuhisa, to Shionogi & Co., Ltd. 1,4-benzodioxine and 1,4-benzodioxine derivatives and production thereof. 4,595,767, Cl. 549-60.000.
Ito, Hiroshi; Hiramatsu, Shigeki; and Takada, Mitsuru, to Toyota Jidosha Kabushiki Kaisha. Method for controlling an engine installed with continuously variable transmission. 4,594,916, Cl. 74-866.000.
Ito, Hiroshi: *See*—
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,594,908, Cl. 74-359.000.
Ito, Mikio. Apparatus for drawing an ellipse using a piece of string. 4,594,784, Cl. 33-30.500.
Ito, Yukio: *See*—
Nagatsuma, Kazuyuki; Ito, Yukio; Takeuchi, Hirosi; Ashida, Sakichi; and Jyomura, Shigeru, 4,595,853, Cl. 310-313.00D.
Itoh, Katsuaki, to Mitsubishi Denki Kabushiki Kaisha. On-load tap changer. 4,595,806, Cl. 200-11.0TC.
Itoh, Tadashi; Murai, Toshiharu; Jinnai, Koichiro; Ishima, Kazumi; Koike, Takahisa; Kato, Toshifumi; and Fukazawa, Takao, to Ricoh Company, Ltd. Multicolor ink jet recording apparatus having means for preventing blurring of ink. 4,595,948, Cl. 358-75.000.
ITP, Inc.: *See*—
Fladlien, David G., 4,595,257, Cl. 350-255.000.
ITT Corporation: *See*—
Shen, Shannon N., 4,595,844, Cl. 307-270.000.
ITT Industries, Inc.: *See*—
Hoehn, Wolfgang, 4,595,912, Cl. 340-347.0DA.
Ivchenko, Nikolai S.: *See*—
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.
Iverson, Gregory: *See*—
Carter, Kelly; Gallagher, Steve; Iverson, Gregory; and Krechmer, Kenneth R., 4,596,021, Cl. 375-5.000.
Iwahashi, Hiroyuki: *See*—
Hakaridani, Mitsuhiro; Nishioka, Yoshiki; and Iwahashi, Hiroyuki, 4,596,031, Cl. 381-43.000.
Iwasaki, Toshio: *See*—
Takeno, Tadayoshi; Ishii, Koichi; Yamane, Koichi; Kita, Kazuo; Iwasaki, Toshio; and Hirase, Koichi, 4,595,519, Cl. 252-146.000.
Iwata, Toshio: *See*—
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; and Ueda, Atsushi, 4,594,982, Cl. 123-425.000.
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; Ueda, Atsushi; and Sasaki, Takeo, 4,594,983, Cl. 123-425.000.
Iwayama, Kenzo; Yoshitomi, Yasunari; and Kuroki, Katsuro, to Nippon Steel Corporation. Grain-oriented silicon steel sheet and process for producing the same. 4,595,426, Cl. 148-31.550.
Izumi, Jun: *See*—
Nakanishi, Kenichi; Tanabe, Seiichi; and Izumi, Jun, 4,595,642, Cl. 429-19.000.
Izuo, Masahiro: *See*—
Shimoda, Shigeaki; Izuo, Masahiro; Nakao, Yuji; Shoji, Masatoshi; and Iida, Masamichi, 4,594,986, Cl. 123-491.000.
J. Eberspacher: *See*—
Gaysert, Gerhard; Gerwin, Reinhard; and Gotz, Dieter, 4,595,356, Cl. 431-352.000.
J. H. Bemecke GmbH: *See*—
Schaefer, Philipp, 4,595,622, Cl. 428-173.000.
J. I. Case Company: *See*—
Grataloup, Xavier R., 4,594,951, Cl. 111-85.000.
Shore, Daniel B., 4,594,938, Cl. 92-82.000.
J. M. Voith GmbH: *See*—
Krautzberger, Frantz, 4,594,963, Cl. 118-610.000.
Jacobson, Carl L.: *See*—
Zahradnik, Raymond L.; Jacobson, Carl L.; and Shen, Jian-Chyun, 4,595,056, Cl. 166-251.000.
Jahns, Thomas M., to General Electric Company. Current-sensing scheme for switched reluctance motor drives. 4,595,865, Cl. 318-254.000.
Jakobsen, Kjell M.; and Nilsson, Torsten, to PLM AB. Method for the crystallization of thermoplastic material. 4,595,550, Cl. 264-292.000.
Janocha, Siegfried: *See*—
Crass, Gunther; Bothe, Lothar; Janocha, Siegfried; and Dietz, Wolfgang, 4,595,625, Cl. 428-215.000.
Jansen, Jozef R.; and Versprille, Adriaan, to Erasmus Universiteit Rotterdam. Method and apparatus for estimating the cardiac output of the heart of a patient. 4,595,015, Cl. 128-713.000.

Janssen, Robert A.: *See*—
Mayhan, Kenneth G.; Janssen, Robert A.; and Drake, Roger F., 4,595,632, Cl. 428-409.000.
Japan Metals & Chemicals Co., Ltd.: *See*—
Katagiri, Kunio; Arimura, Joji; Kondo, Kazuo; and Fujise, Taisuke, 4,595,059, Cl. 166-290.000.
Jarrett, Bobby R., to United States of America, Navy. N-bit propagatary analog-to-digital converter system. 4,595,909, Cl. 340-347.0AD.
Jean Walterscheid GmbH: *See*—
Nienhaus, Clemens, 4,595,383, Cl. 464-162.000.
Jedamzik, Erwin: *See*—
Lenze, Friedrich; and Jedamzik, Erwin, 4,595,219, Cl. 285-333.000.
Jeenicke, Edmund: *See*—
Gloss, Erwin; Jeenicke, Edmund; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; van Woudenberg, Jan F.; and Zucker, Udo, 4,594,981, Cl. 123-424.000.
Jenniches, Frieda S.: *See*—
Hall, Richard L.; Jenniches, Frieda S.; Kehoe, James R.; Strong, David G.; and Silcott, Edward N., 4,595,816, Cl. 219-121.0LD.
Jennings, Charles E.; and Hopkins, Bob C., to FMC Corporation. Subsea casing hanger suspension system. 4,595,063, Cl. 166-382.000.
Jermasen, Torris G.: *See*—
Oswald, Alexis A.; Jermasen, Torris G.; Westner, Andrew A.; and Huang, I-der, 4,595,753, Cl. 546-21.000.
Jeromin, Lutz; Johannisbauer, Wilhelm; Thorausch, Klaus; Skrapac, Franjo; Hartmann, Helmut; Hentschel, Karl; and Michel, Otto, to Henkel Kommanditgesellschaft auf Aktien. Process for the non-degenerative distillation of fatty acids. 4,595,461, Cl. 203-72.000.
Jessup, James L.: *See*—
Cianci, James P.; Jessup, James L.; and Seeley, Daniel J., 4,595,102, Cl. 206-572.000.
Jinnai, Koichiro: *See*—
Itoh, Tadashi; Murai, Toshiharu; Jinnai, Koichiro; Ishima, Kazumi; Koike, Takahisa; Kato, Toshifumi; and Fukazawa, Takao, 4,595,948, Cl. 358-75.000.
Jinotti, Walter J. Dual-purpose catheter. 4,595,005, Cl. 128-205.240.
Jochum, Peter, to Hilti Aktiengesellschaft. Explosive charge operated device for driving fastening elements. 4,595,134, Cl. 227-9.000.
Johannes Moeller Hamburg GmbH & Co. KG: *See*—
Moller, Hermann; Muschelknautz, Edgar; and Pust, Jurgen, 4,595,317, Cl. 406-95.000.
Johannisbauer, Wilhelm: *See*—
Jeromin, Lutz; Johannisbauer, Wilhelm; Thorausch, Klaus; Skrapac, Franjo; Hartmann, Helmut; Hentschel, Karl; and Michel, Otto, 4,595,461, Cl. 203-72.000.
John Valves Pty., Ltd.: *See*—
Banks, William, 4,595,032, Cl. 137-527.000.
John Zink Company: *See*—
Gronwick, Jerry P.; and Augustine, Robert J., 4,594,801, Cl. 38-90.000.
Johnson & Johnson Dental Products Company: *See*—
De Luca, Robert D.; and Forbes-Jones, Robin M., 4,595,598, Cl. 427-2.000.
Johnson, Kirk B., to Ethylene Corp. Dip tube sampling means for chemical reactors. 4,594,903, Cl. 73-863.830.
Johnson, Leighton C.: *See*—
Boger, David L.; Johnson, Leighton C.; and Pugh, Jerry T., 4,595,439, Cl. 156-178.000.
Johnson, Robert N.: *See*—
Rongus, Leo P.; Overman, David L.; and Johnson, Robert N., 4,594,944, Cl. 102-221.000.
Johnson, Royce O., Jr. Machine for rebuilding drive shafts. 4,594,757, Cl. 29-33.00K.
Johnson, Russell L.; and Lassen, Frederich O., to Kimberly-Clark Corporation. Interlabial pad. 4,595,392, Cl. 604-385.00A.
Johnston, Charles F., to Vitec Controls, Inc. Rotary control valve having quick emergency exhausting means. 4,595,036, Cl. 137-636.400.
Joly, Jean; and Oehlert, Yves, to La Telemecanique Electrique. Modular apparatus for coded interconnection between electronic cards and a printed circuit board. 4,595,250, Cl. 339-17.0LM.
Joly, Jean: *See*—
Oehlert, Yves; Neyroud, Jean; and Joly, Jean, 4,595,249, Cl. 339-17.0LM.
Jones, Frank D.: *See*—
Chan, Yuen H.; Jones, Frank D.; and Stinson, William F., 4,596,002, Cl. 365-189.000.
Jones, Jackie D.: *See*—
Murphy, Guy C.; Jones, Jackie D.; and Salemme, Charles T., 4,594,761, Cl. 29-156.80R.
Jones, James H., to Ford Motor Company. Air atomizing throttle body. 4,595,542, Cl. 261-53.000.
Jones, Randolph W.; and Callahan, Alfred S., to Neurologics, Inc. Electrode harness. 4,595,013, Cl. 128-644.000.
Jons, Ebbe S.: *See*—
Andreasen, Jens; Donnelly, James R.; Felsvang, Karsten S.; Jons, Ebbe S.; and Veltman, Preston L., 4,595,576, Cl. 423-242.000.
Jonsson, Nils A.; and Mossberg, Bengt, to Alfa-Laval AB. Lining of non-metallic material. 4,595,208, Cl. 277-206.00R.
Josefowicz, Jack Y., to Atlantic Richfield Company. Metal electrolysis using a low temperature bath. 4,595,466, Cl. 204-67.000.
Joustra S.A.: *See*—
Dibold, Camille; and Rubach, Frederic, 4,595,381, Cl. 446-463.000.
Joy, John R., to Williams International Corporation. Combined cycle total energy system. 4,594,850, Cl. 60-39.141.
Judd, Claude I.: *See*—
Mardi, Shalva; Lichti, Heinz F.; Baumgartner, Guido; Garteiz, Daniel; Judd, Claude I.; and Weiner, Murray, 4,595,591, Cl. 424-127.000.
Jue, Gary: *See*—
Gunnerson, Robert E.; and Jue, Gary, 4,595,595, Cl. 426-438.000.
Jufuku, Yasunobu: *See*—
Okawa, Susumu; Jufuku, Yasunobu; and Okuwaki, Shigeru, 4,595,386, Cl. 474-201.000.
Julius Blum Gesellschaft mbH: *See*—
Rock, Erich; and Brunner, Josef, 4,595,245, Cl. 312-330.00R.
Jungblut, Camille: *See*—
Blondel, Philippe; and Jungblut, Camille, 4,595,730, Cl. 525-178.000.
Jyomura, Shigeru: *See*—
Nagatsuma, Kazuyuki; Ito, Yukio; Takeuchi, Hirosi; Ashida, Sakichi; and Jyomura, Shigeru, 4,595,853, Cl. 310-313.00D.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Ohkubo, Masahiro, 4,595,382, Cl. 464-82.000.
Kabushiki Kaisha Four Brain: *See*—
Kusano, Takae; and Ueno, Masato, 4,595,364, Cl. 433-185.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Koizumi, Yukio; and Miyazawa, Hiroshi, 4,595,108, Cl. 212-267.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ono, Takashi; and Otsubo, Kazuhiko, 4,595,333, Cl. 414-729.000.
Kabushiki Kaisha Patine Shokai: *See*—
Ohashi, Kazuo, 4,594,859, Cl. 62-235.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Yasukawa, Kazuyoshi; and Hayashi, Yoshio, 4,595,989, Cl. 364-513.000.
Kabushiki Kaisha Toshiba: *See*—
Horioka, Keiji; Okano, Haruo; and Sekine, Makoto, 4,595,601, Cl. 427-53.100.
Masuda, Youichi; and Onodera, Toshihiro, 4,595,973, Cl. 363-18.000.
Matsuo, Naohiko, 4,595,278, Cl. 355-14.00R.
Oushiden, Hideshi; and Nishijima, Akihiro, 4,595,281, Cl. 355-51.000.
Shiraki, Hachio; and Murase, Satoru, 4,595,898, Cl. 335-216.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Takahashi, Hideaki; Kondo, Haruyoshi; Saji, Keiichi; Hayakawa, Kiyoharu; and Takeuchi, Takashi, 4,595,485, Cl. 204-406.000.
Kabushiki Kaisha Yaskawa Denki Seisakusho: *See*—
Kimura, Karou; and Ogawa, Junichiro, 4,594,918, Cl. 74-665.00A.
Kagata, Akira: *See*—
Yoshikane, Tetsuo; Kagata, Akira; and Hiura, Hiromi, 4,596,009, Cl. 369-173.000.
Kai, Junjiro: *See*—
Kusakawa, Hideaki; and Kai, Junjiro, 4,595,459, Cl. 202-177.000.
Kaiser, Joachim: *See*—
Henning, Rainer; Lerch, Ulrich; and Kaiser, Joachim, 4,595,685, Cl. 514-225.000.
Kalamasz, Thomas G., to TRW Inc. Forging lubricant. 4,595,473, Cl. 204-181.100.
Kali-Chemie AG: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,595,531, Cl. 260-239.0BD.
Kalkhof, Bernd; and Lohmuller, Horst, to Robert Bosch GmbH. Electronic final stage for switching electro-magnetic valve with the assistance of controlled current source. 4,595,968, Cl. 361-152.000.
Kamatani, Yoshio; and Sakamoto, Takurou, to Takeda Chemical Industries, Ltd. Method for producing polyurethane resins. 4,595,741, Cl. 528-53.000.
Kameda, Yukihiko: *See*—
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,595,678, Cl. 514-53.000.
Kamil, Zvi; and Lipson, Stephen G., to Elscint Ltd. Gradient field coils for NMR imaging. 4,595,900, Cl. 335-299.000.
Kanamori, Nobutaka: *See*—
Sago, Yoshiharu; Kurosawa, Masaji; and Kanamori, Nobutaka, 4,595,403, Cl. 55-389.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Azuma, Masaaki; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,595,752, Cl. 544-258.000.
Kaneko, Takaoki: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,595,570, Cl. 422-186.050.
Kanno, Isao, to Sanshin Kogyo Kabushiki Kaisha. Over-revolution preventing apparatus for internal combustion engines. 4,594,978, Cl. 123-335.000.
Kanno, Yoshiaki: *See*—
Wataya, Seiji; Kanno, Yoshiaki; Nishimura, Yukinobu; Shimomura, Setsuhiro; and Matsumoto, Osamu, 4,594,987, Cl. 123-494.000.
Kao Corporation: *See*—
Okamoto, Masakatsu; Nagao, Shigeru; and Yagi, Kazuhisa, 4,595,394, Cl. 8-139.000.
Takeno, Tadayoshi; Ishii, Koichi; Yamane, Koichi; Kita, Kazuo; Iwasaki, Toshio; and Hirase, Koichi, 4,595,519, Cl. 252-146.000.
Kao, Jar-Lin: *See*—
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,595,668, Cl. 502-66.000.

Kaplan, Paul M.: *See—*
Reckel, Rudolph P.; Harris, Joanne L.; Wellerson, Ralph, Jr.; Shaw, Sally M.; and Kaplan, Paul M., 4,595,654, Cl. 435-7.000.
Kaplita, George A.: *See—*
Giammarco, Nicholas J.; and Kaplita, George A., 4,595,484, Cl. 204-298.000.
Karavaev, Alexandr A.: *See—*
Semenov, Pavel A.; Fedorov, Svyatoslav N.; Mironova, Emilia M.; Egorova, Eleonora V.; and Karavaev, Alexandr A., 4,595,017, Cl. 128-733.000.
Karhu-Titan Oy: *See—*
Tiitola, Antti-Jussi, 4,595,215, Cl. 280-604.000.
Karl Mengele & Sohne GmbH & Co.: *See—*
Wistuba, Eberhard; and Lenzer, Xaver, 4,594,841, Cl. 56-13.300.
Kasei Optonix, Ltd.: *See—*
Shimizu, Etsuo; Aoki, Yuji; Suzuki, Yujiro; and Miura, Norio, 4,595,639, Cl. 428-690.000.
Kasparek, Alois: *See—*
Wahle, Gunter; and Kasparek, Alois, 4,595,025, Cl. 131-94.000.
Katagiri, Kunio; Arimura, Joji; Kondo, Kazuo; and Fujise, Taisuke, to Japan Metals & Chemicals Co., Ltd.; and Shimizu Construction Co., Ltd. Method of providing a conductor pipe to an opening portion of a well. 4,595,059, Cl. 166-290.000.
Kato, Hitoshi; and Kawamoto, Eiji, to Tokyo Yogyo Kabushiki Kaisha. Leg for vacuum tank for refining molten steel. 4,595,178, Cl. 266-280.000.
Kato, Toshifumi: *See—*
Itoh, Tadashi; Murai, Toshiharu; Jinnai, Koichiro; Ishima, Kazumi; Koike, Takahisa; Kato, Toshifumi; and Fukazawa, Takao, 4,595,948, Cl. 358-75.000.
Katz, Allen: *See—*
Martinetti, James L.; and Katz, Allen, 4,595,892, Cl. 333-218.000.
Katz, Richard M.: *See—*
McCallister, William O.; and Katz, Richard M., 4,595,917, Cl. 340-703.000.
Kauffman, Jim W.: *See—*
Baldwin, Roger A.; Kauffman, Jim W.; and Laughlin, William C., 4,595,558, Cl. 419-66.000.
Kauffman, Kenneth: *See—*
Kauffman, Lawrence R.; and Kauffman, Kenneth, 4,595,175, Cl. 256-1.000.
Kauffman, Lawrence R.; and Kauffman, Kenneth. Fenceliner. 4,595,175, Cl. 256-1.000.
Kaufman, Dan R., to International Business Machines Corporation. High speed memory with a multiplexed address bus. 4,596,004, Cl. 365-233.000.
Kaufman, William E., to Mobil Oil Corporation. Thermocouple drive assembly. 4,595,300, Cl. 374-170.000.
Kaunitz, Clyde F. Method and apparatus for preparing pipe sections for welding. 4,594,873, Cl. 72-340.000.
Kaup & Co. KG: *See—*
Kaup, Otmar, 4,595,224, Cl. 294-81.200.
Kaup, Otmar, to Kaup & Co. KG. Carrying device for containers. 4,595,224, Cl. 294-81.200.
Kawaguchi, Hideo: *See—*
Ando, Hideo; Kawaguchi, Hideo; and Watanabe, Yasuhiko, 4,594,953, Cl. 112-112.000.
Kawaharazuka, Yukio; and Iida, Giichi, to Kioritz Corporation. Blower/spray device. 4,595,142, Cl. 239-373.000.
Kawakami, Hidenori: *See—*
Nishiyama, Ryota; Amano, Masahiro; Seino, Shunji; Gamou, Yutaka; and Kawakami, Hidenori, 4,595,457, Cl. 162-123.000.
Kawamoto, Eiji: *See—*
Kato, Hitoshi; and Kawamoto, Eiji, 4,595,178, Cl. 266-280.000.
Kawamura, Naoto; and Masuda, Yukio, to Canon Kabushiki Kaisha. Image processing apparatus. 4,595,956, Cl. 358-283.000.
Kawamura, Shuzo: *See—*
Maeda, Masato; and Kawamura, Shuzo, 4,594,879, Cl. 73-27.00R.
Kawanabe, Tomohiko: *See—*
Shimamura, Haruo; Yatabe, Fumio; Noguchi, Kunio; and Kawanabe, Tomohiko, 4,594,977, Cl. 123-327.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Matsumura, Takahiro; and Inui, Yoshiharu, 4,595,162, Cl. 248-68.100.
Yazaki, Mitsuhiro, 4,595,030, Cl. 137-203.000.
Kawasaki Steel Corporation: *See—*
Sato, Kuniaki; Nakajima, Yasuhisa; Soeda, Naohiko; Ohta, Norio; and Nagashima, Atsushi, 4,595,357, Cl. 432-8.000.
Takeno, Tadayoshi; Ishii, Koichi; Yamane, Koichi; Kita, Kazuo; Iwasaki, Toshio; and Hirase, Koichi, 4,595,519, Cl. 252-146.000.
Kays, William A.: *See—*
Trumbore, David C.; and Kays, William A., 4,595,443, Cl. 156-296.000.
Kearney, Anthony D., to Coolair Corporation PTE., Ltd. Fan volute and spreader. 4,594,861, Cl. 62-304.000.
Keely, Jerry A.: *See—*
Crea, David A.; Robertson, James A.; and Keely, Jerry A., 4,595,492, Cl. 209-2.000.
Keeven, James C.; Felin, Donald R.; and Fisher, Henry J., to FL Industries, Inc. Metal cladding of wire by atomization spraying. 4,595,600, Cl. 427-5.000.
Kehoe, James R.: *See—*
Hall, Richard L.; Jenniches, Frieda S.; Kehoe, James R.; Strong, David G.; and Silcott, Edward N., 4,595,816, Cl. 219-121.0LD.
Keiper Recaro GmbH & Co.: *See—*
Goldner, H. Walther, 4,595,238, Cl. 297-452.000.
Kellogg, Thomas W.: *See—*
Gould, Jerome; and Kellogg, Thomas W., 4,595,111, Cl. 215-303.000.
Kelly, Michael G.; and Steckelberg, Willi R., to American Hoescht Corporation. Soil repellent fluorinated esters of multi-ring anhydride systems. 4,595,628, Cl. 428-265.000.
Kemble, Mern S.; and Mancusso, Matthew. Method and apparatus for lifting ingot molds and like objects. 4,595,225, Cl. 294-86.410.
Kemira Oy: *See—*
Tahvonen, Risto, 4,595,589, Cl. 424-93.000.
Kempfert, Joachim R.: *See—*
Oeste, Franz D.; and Kempfert, Joachim R., 4,595,575, Cl. 423-210.000.
Kenan, Richard P.: *See—*
Verber, Carl M.; and Kenan, Richard P., 4,595,994, Cl. 364-841.000.
Kendall Company, The: *See—*
Cianci, James P.; Jessup, James L.; and Seeley, Daniel J., 4,595,102, Cl. 206-572.000.
Kenison, David F.; and Sheppard, Donald E., to United Technologies Corporation. Apparatus for synthesizing control parameters. 4,594,849, Cl. 60-39.290.
Kennan, Wayne, to Avantek, Inc. Distributed amplifier using dual-gate GaAs FET's. 4,595,881, Cl. 330-54.000.
Kennecott Corporation: *See—*
Nunlist, Erwin J., 4,595,487, Cl. 204-433.000.
Nunlist, Erwin J., 4,595,614, Cl. 428-35.000.
Kent, Raymond C.; and Haines, Charles, Jr., to Armstrong World Industries, Inc. Process for making a yarn covered fabric. 4,595,438, Cl. 156-148.000.
Kepler, Arthur M.: *See—*
LeBreton, Edward T.; Kepler, Arthur M.; and Groves, Clyde W., 4,595,037, Cl. 138-30.000.
Kern, Hans: *See—*
Arens, Hans; Kern, Hans; and Haslberger, Richard, 4,595,031, Cl. 137-492.500.
Kerr Glass Manufacturing Corporation: *See—*
Herr, James E., 4,595,110, Cl. 215-252.000.
Herr, James E., 4,595,547, Cl. 264-154.000.
Kerr-McGee Chemical Corporation: *See—*
Baldwin, Roger A.; Kauffman, Jim W.; and Laughlin, William C., 4,595,558, Cl. 419-66.000.
Kerschgens, Johann J. Irradiation device. 4,595,838, Cl. 250-504.00R.
Kervennal, Jacques; and Mathais, Henri, to Atochem. Low melting point diphenylethane diisocyanate mixtures, method of making the same, and polyurethanes made therefrom. 4,595,744, Cl. 528-83.000.
Ketels, Gerardus H. J., to Protecon B.F. Device for deboning meat. 4,594,751, Cl. 17-1.00G.
Kidd, William J.: *See—*
Reed, Richard A.; and Kidd, William J., 4,595,186, Cl. 269-69.000.
Kierstead, Richard W.: *See—*
Boris, Alfred; Guthrie, Robert W.; and Kierstead, Richard W., 4,595,689, Cl. 514-337.000.
Kilpert, Richard: *See—*
Wolfe, Edward I.; Wasserstrom, David H.; and Kilpert, Richard, 4,595,508, Cl. 210-631.000.
Kimberly-Clark Corporation: *See—*
Johnson, Russell L.; and Lassen, Frederich O., 4,595,392, Cl. 604-385.00A.
Norman, Eugene, 4,594,901, Cl. 73-861.040.
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., to Phillips Petroleum Company. Tri-alkali metal-di(carboxyalkyl)dithiocarbamate and triammonium-di(carboxyalkyl)dithiocarbamate flotation agents. 4,595,538, Cl. 260-502.560.
Kimoto, Yutaka; Morioka, Toru; and Mitani, Yasuo, to Sanyo Electric Co., Ltd. Electric shaver with a drive regulator. 4,594,777, Cl. 30-42.000.
Kimura, Karou; and Ogawa, Junichiro, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Wrist mechanism for industrial robot. 4,594,918, Cl. 74-665.00A.
Kimura, Kazuo; Sakai, Kunihide; Inoue, Chikara; Hayashi, Hiroyuki; Takayasu, Toyoaki; Ayabe, Yasuhiro; and Miyake, Kayoko, to Victor Company of Japan, Limited. Magnetic head and method of making the same. 4,595,964, Cl. 360-125.000.
Kimura, Kunio: *See—*
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, 4,595,664, Cl. 501-124.000.
Kimura, Yasuhiro; and Niki, Katsumi, to Ajinomoto Co., Inc. Modified electrode. 4,595,479, Cl. 204-294.000.
King, Edward M.; Gsteiger, Kurt E.; and Raby, Joseph S., to Harris Corporation. Method for selective deposition of tungsten on silicon. 4,595,608, Cl. 427-237.000.
King Instrument Corporation: *See—*
Woodley, George M., 4,595,327, Cl. 414-126.000.
King, James L.: *See—*
Frank, James P.; and King, James L., 4,594,773, Cl. 29-622.000.
Kinnear, Joseph W. Strand covering devices and methods. 4,594,765, Cl. 29-450.000.
Kinoshita, Katsuyuki; and Suzuki, Yoshiji, to Hamamatsu Photonics Kabushiki Kaisha. Imaging and streaking tubes, and methods for fabricating the imaging and streaking tubes. 4,595,375, Cl. 445-14.000.
Kioritz Corporation: *See—*
Kawaharazuka, Yukio; and Iida, Giichi, 4,595,142, Cl. 239-373.000.
Kirman, Richard G.; and Langdon, Roger M., to Fisher Controls International, Inc. Force sensors. 4,594,898, Cl. 73-778.000.

Kita, Kazuo: *See*—
Takeno, Tadayoshi; Ishii, Koichi; Yamane, Koichi; Kita, Kazuo; Iwasaki, Toshio; and Hirase, Koichi, 4,595,519, Cl. 252-146.000.
Kitagawa, Hiroji, to Kitagawa Industries Co., Ltd. Fixing appliance. 4,595,185, Cl. 269-43.000.
Kitagawa Industries Co., Ltd.: *See*—
Kitagawa, Hiroji, 4,595,185, Cl. 269-43.000.
Kitajima, Masahiko: *See*—
Maruyama, Hisao; Kitajima, Masahiko; and Matsubara, Tsutomu, 4,595,544, Cl. 264-46.500.
Kiyohara, Takehiko: *See*—
Nakajima, Toshifumi; and Kiyohara, Takehiko, 4,595,936, Cl. 346-139.00R.
Kjersem, Jens A. Rocking chair. 4,595,234, Cl. 297-258.000.
Klassen, Clarence J.: *See*—
Murdoch, James C.; and Klassen, Clarence J., 4,594,880, Cl. 73-32.00R.
Klassen, David D.; and Ballantyne, Douglas B., to General Electric Company. Gas turbine bladed disk assembly. 4,595,340, Cl. 416-193.00A.
Klasson, Jan: *See*—
Andersson, Roger; Engdahl, Lennart; and Klasson, Jan, 4,594,843, Cl. 56-295.000.
Klein, Klausjorg: *See*—
Patzschke, Hans-Peter; Gobel, Armin; and Klein, Klausjorg, 4,595,717, Cl. 523-414.000.
Kleykamp, Donald L., to Dayco Corporation. Holddown bar for a hatch cover of a railroad car. 4,594,949, Cl. 105-377.000.
Klier, Heinz: *See*—
Klier, Kurt; and Klier, Heinz, 4,594,847, Cl. 59-85.000.
Klier, Kurt; and Klier, Heinz, to E.H. Ashley & Company, Inc. Detachably interconnectable chain link and chain constructed therewith. 4,594,847, Cl. 59-85.000.
Kling, Michael J.: *See*—
Marino, Joseph A.; Puetz, Peter A.; Kling, Michael J.; Finn, Curtis A.; Pendell, John C.; and Crawford, Michael C., 4,594,789, Cl. 33-288.000.
Klingensmith, James D.; and Hovland, Lyle W., to Aluminum Company of America. Adjustable anchoring assembly. 4,595,165, Cl. 248-539.000.
Klos, Terry J.: *See*—
Heile, Bernard J.; and Klos, Terry J., 4,595,520, Cl. 252-160.000.
Klosiewicz, Daniel W., to Hercules Incorporated. N-alkyl methacrylate modified polypropylene. 4,595,726, Cl. 525-71.000.
Kneer, Franz X., to Gebruder Weiss K.G. Filtering aid for the treatment of suspensions, particularly of domestic, industrial, and other sludges for subsequent draining. 4,595,506, Cl. 210-609.000.
Kneisel, Joseph P. Roof flashing for use with roof planking. 4,594,819, Cl. 52-60.000.
Knepper, J. Irvine; Garrecht, Robert J.; and Dear, George W., to Petrolite Corporation. Corrosion inhibition in engine fuel systems. 4,595,523, Cl. 252-390.000.
Knox, Jack M.: *See*—
Hung, William M.; and Knox, Jack M., 4,595,536, Cl. 260-394.000.
Kobayashi, Hiroshi; Hirose, Tsuguhiro; and Haruyama, Hideaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Data transmission system for a local network. 4,596,011, Cl. 370-85.000.
Kobayashi, Masahiro: *See*—
Kuze, Katsuaki; Matsuyama, Yujiro; Maeda, Kozo; Ota, Takeshi; Kobayashi, Masahiro; Hongo, Tsuyoshi; and Makimura, Osamu, 4,595,715, Cl. 523-181.000.
Kobayashi, Michiaki: *See*—
Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, 4,594,868, Cl. 72-12.000.
Kobayashi, Richard M.: *See*—
Vargas, Roger I.; Mabry, Harold E.; Myers, Arthur L.; and Kobayashi, Richard M., 4,594,964, Cl. 119-1.000.
Kobayashi, Yoshiaki: *See*—
Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, 4,595,895, Cl. 335-26.000.
Koblitz, Francis F., to AMP Incorporated. Flame retardant sealant. 4,595,724, Cl. 524-409.000.
Kobus, Joseph P.; and Ringer, Kenneth A., to United States of America, Army. Dual space fed parallel plate lens antenna beamforming system. 4,595,926, Cl. 343-368.000.
Koch, Dieter, to Institut fur Kerntechnik und Energiewandlung e.V. Method and system for deflecting a focussed electron beam along a predetermined processing path. 4,595,819, Cl. 219-121.0EB.
Kochs Adler, AG: *See*—
Bernewasser, Horst, 4,594,954, Cl. 112-121.150.
Kodama, Satoru: *See*—
Hirai, Kazumi; Akiyoshi, Mitsuo; Nakano, Chikao; Watanabe, Kenji; and Kodama, Satoru, 4,595,827, Cl. 219-518.000.
Koehler, Gerard, to La Telemecanique Electrique. Stepping motor of hybrid multi-phase type and device for its control. 4,595,871, Cl. 318-696.000.
Koether, Frederick G.: *See*—
Ziegler, Theodore J.; Eydelman, Alexander; Koether, Frederick G.; and Lawrance, Robert A., 4,594,824, Cl. 52-118.000.
Koike, Takahisa: *See*—
Itoh, Tadashi; Murai, Toshiharu; Jinnai, Koichiro; Ishima, Kazumi; Koike, Takahisa; Kato, Toshifumi; and Fukazawa, Takao, 4,595,948, Cl. 358-75.000.
Koizumi, Yukio; and Miyazawa, Hiroshi, to Kabushiki Kaisha Kobe Seiko Sho. Method for stretching and folding extension jib in wheeled type crane. 4,595,108, Cl. 212-267.000.
Kojima, Hiroshi: *See*—
Dan, Takuya; Kojima, Hiroshi; and Orikawa, Michihiro, 4,595,183, Cl. 267-140.100.
Koken Ltd.: *See*—
Tajima, Tomoyuki, 4,595,657, Cl. 435-41.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Tatekura, Koichi; Mochizuki, Kiyofumi; and Ejiri, Yoshihiro, 4,595,284, Cl. 356-73.100.
Kolm, Henry H.; and Carter, Robert E., to Piezo Electric Products, Inc. Non-vibrational oscillating blade piezoelectric blower. 4,595,338, Cl. 416-81.000.
Kolondra, Frank: *See*—
Wu, Chung P.; and Kolondra, Frank, 4,595,837, Cl. 250-492.200.
Komag, Inc.: *See*—
Allen, Ronald; and Chen, Tu, 4,595,481, Cl. 204-298.000.
Kondo, Fumio: *See*—
Ogasa, Tadayoshi; and Kondo, Fumio, 4,595,572, Cl. 423-25.000.
Kondo, Haruyoshi: *See*—
Takahashi, Hideaki; Kondo, Haruyoshi; Saji, Keiichi; Hayakawa, Kiyoharu; and Takeuchi, Takashi, 4,595,485, Cl. 204-406.000.
Kondo, Kazuo: *See*—
Katagiri, Kunio; Arimura, Joji; Kondo, Kazuo; and Fujise, Taisuke, 4,595,059, Cl. 166-290.000.
Kondo, Koichi: *See*—
Nozawa, Nobuaki; and Kondo, Koichi, 4,595,043, Cl. 160-36.000.
Kondo, Tadashi: *See*—
Morisawa, Kunio; and Kondo, Tadashi, 4,595,087, Cl. 192-67.00R.
Konishi, Takao: *See*—
Ogata, Masaru; Sato, Kosaburo; and Konishi, Takao, 4,595,780, Cl. 564-79.000.
Konishiroku Photo Ind. Co., Ltd.: *See*—
Kuru, Hiroshi; Sakaguchi, Hirofumi; and Shiozawa, Takao, 4,595,279, Cl. 355-14.00R.
Kontron Holding A.G.: *See*—
Degrave, Philippe L., 4,595,563, Cl. 422-72.000.
Kopp, Richard: *See*—
Hombach, Rudolf; Dollhausen, Manfred; Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Reischl, Artur, 4,595,445, Cl. 156-307.300.
Kordi, Mokhlis E.: *See*—
Pierre, Gerard; Kordi, Mokhlis E.; and Cauquis, Georges, 4,595,467, Cl. 204-79.000.
Kormanik, Richard; Dejewski, Karen; and Brummond, Robert, to Envirex Inc. Gravity belt thickener and belt press combination. 4,595,499, Cl. 210-202.000.
Koshiba, Nobuharu; Hayakawa, Hayashi; Momose, Keigo; and Ohta, Akira, to Matsushita Electrical Industrial Co., Ltd. Air cell electrode and process for preparing its catalyst. 4,595,643, Cl. 429-27.000.
Kotke, Edwin J. Boat hoist. 4,595,313, Cl. 405-2.000.
Kotobuki Seiyaku Co. Ltd.: *See*—
Takase, Kahei; Yasunami, Masafumi; Tomiyama, Tsuyoshi; Tomiyama, Akira; and Yanagisawa, Takashi, 4,595,694, Cl. 514-492.000.
Kovacs, Ferenc: *See*—
Bullock, Lance W.; Vlahek, Josip; and Kovacs, Ferenc, 4,595,554, Cl. 264-522.000.
Kowal, Leonard J.: *See*—
Carr, John F.; Kowal, Leonard J.; and Schwarz, Albert J., 4,595,218, Cl. 285-47.000.
Koyabu, Yukio: *See*—
Matsuoka, Toshio; Kurozu, Shinichi; Koyabu, Yukio; Nagayasu, Tadamitu; and Sugimori, Seiji, 4,595,574, Cl. 423-107.000.
Koyama, Hideo; Hoh, Takeshi; Noguchi, Fumio; and Nobuhara, Yoshiaki, to Shin-Meiwa Industry Co., Ltd. Automatic bending apparatus. 4,594,870, Cl. 72-24.000.
Kozuti Kozlekedesi Tudomanyos Kutato Intezet: *See*—
Bohm, Nandor; Bohm, Janos; and Bohm, Robert, 4,595,184, Cl. 267-156.000.
Krabetz, Richard: *See*—
Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,595,778, Cl. 560-208.000.
Kraft, Inc.: *See*—
Roland, John F.; Cayle, Theodore; Dinwoodie, Robert C.; and Mehnert, David W., 4,595,659, Cl. 435-135.000.
Kramer, Edward J.: *See*—
McCreedy, Kathleen M.; Kramer, Edward J.; and Tung, Lu H., 4,595,707, Cl. 521-62.000.
Kramer, Gideon A., to Source Kramer Corporation. Multiple projection optics slide projection apparatus using a circular slide tray, having fixed-position slide gates. 4,595,266, Cl. 353-94.000.
Kranz, Curt: *See*—
Anapliotis, Emmanuel; and Kranz, Curt, 4,595,393, Cl. 623-22.000.
Krause, Robert F.: *See*—
DelVecchio, Robert M.; and Krause, Robert F., 4,595,843, Cl. 307-83.000.
Krautzberger, Frantz, to J. M. Voith GmbH. Coating device for coating traveling webs of material. 4,594,963, Cl. 118-610.000.
Krechmer, Kenneth R.: *See*—
Carter, Kelly; Gallagher, Steve; Iverson, Gregory; and Krechmer, Kenneth R., 4,596,021, Cl. 375-5.000.
Kregness, Glen R.; Dekarske, Clarence W.; and Criswell, Peter B., to Sperry Corporation. Programmable data reformat system. 4,595,911, Cl. 340-347.0DD.
Kreutel, Randall W., Jr., to Communications Satellite Corporation. Scheme for aberration correction in scanning or multiple beam confocal antenna system. 4,595,929, Cl. 343-781.00P.

Kristel, Ira B., to 21st Century Envelope Co., Inc. Two-way envelope. 4,595,138, Cl. 229-73.000.
Kristiansen, Juan C., to Metalurgica Industrial Mecanica S.A. Reperforable bridge plug. 4,595,052, Cl. 166-123.000.
Krob, Dennis J.; Cieniawa, Edward; and Liburdi, Francesio, to Allied Corporation. Modularized 66-block. 4,595,799, Cl. 179-98.000.
Krohn, Ulrich; Olapinski, Hans; and Dworak, Ulf, to Feldmuhle Aktiengesellschaft. Sintered ceramic shaped article wholly or predominantly of eutectic microstructure constituents. 4,595,663, Cl. 501-103.000.
Krohn, William: *See*—
Amodeo, Ralph J.; and Krohn, William, 4,595,292, Cl. 356-346.000.
Kronenberg, Lee H., to Lee BioMolecular Research Laboratories, Inc. Process for assaying cellular immunity. 4,595,653, Cl. 435-5.000.
Krupp-Koppers GmbH: *See*—
Berns, Horst, 4,595,491, Cl. 208-326.000.
Krupp Polysius AG: *See*—
Kukuck, Karl-Heinz, 4,595,494, Cl. 209-224.000.
Krus, Werner, to Rockwell International. Method of and device for producing bundles from strip and bundle produced thereby. 4,595,619, Cl. 428-114.000.
Kryter, Karl D. Storage case for magnetic tape cassettes, their boxes and the like. 4,595,098, Cl. 206-387.000.
Kubo, Masahiro: *See*—
Dohnomoto, Tadashi; and Kubo, Masahiro, 4,595,638, Cl. 428-614.000.
Kubo, Seitoku; Morisawa, Kunio; and Miura, Masakatsu, to Toyota Jidosha Kabushiki Kaisha; and Aisin-Warner Limited. Transverse type automatic transmission with intermediate power transfer through lay shaft. 4,594,914, Cl. 74-730.000.
Kubo, Tatsuki: *See*—
Takase, Shinji; Inoue, Akira; Omata, Tatuo; Mori, Masao; Yamazaki, Yoshihiro; and Kubo, Tatsuki, 4,595,667, Cl. 502-63.000.
Kubota, Keiichi, to NEC Corporation. Liquid crystal projection display with even temperature elevation. 4,595,260, Cl. 350-351.000.
Kudo, Kiyoshi: *See*—
Sugita, Nobuyuki; Kudo, Kiyoshi; and Nagaoka, Koichi, 4,595,470, Cl. 204-157.870.
Kuhara, Yoshiki; Tada, Koji; Tatsumi, Masami; and Hamazaki, Yuuji, to Sumitomo Electric Industries, Ltd. Optical voltage and electric field sensor. 4,595,876, Cl. 324-96.000.
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. 3- and 5-[bicyclic ether or bicyclic alkylene thioether]alkylene amino thiatriazines, and their pharmaceutical uses. 4,595,683, Cl. 514-222.000.
Kukuck, Karl-Heinz, to Krupp Polysius AG. Apparatus for separating ferromagnetic particles from a slurry. 4,595,494, Cl. 209-224.000.
Kulkarni, Sudhir S.: *See*—
Chang, Y. Alice; Kulkarni, Sudhir S.; and Funk, Edward W., 4,595,507, Cl. 210-638.000.
Kunze, Walter; and Hess, Alfred, to Veit GmbH & Co. Carrier structure for a suspension conveyor system. 4,595,106, Cl. 211-118.000.
Kupersmit, Julius B. Reinforcing element for collapsible container. 4,595,137, Cl. 229-41.00R.
Kurahashi, Takashi: *See*—
Fukatsu, Yoshiaki; Kurahashi, Takashi; and Matsui, Kazuma, 4,595,866, Cl. 318-444.000.
Kurihara, Kazumasa: *See*—
Arai, Kenji; Inamo, Masaharu; and Kurihara, Kazumasa, 4,595,979, Cl. 364-174.000.
Kurokawa, Masahito, to San-Ai Kogyo Kabushiki Kaisha. Vibration isolating table device. 4,595,166, Cl. 248-559.000.
Kuroki, Katsuro: *See*—
Iwayama, Kenzo; Yoshitomi, Yasunari; and Kuroki, Katsuro, 4,595,426, Cl. 148-31.550.
Kuroki, Yoshifumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Method of sending and receiving signals in photography with camera and camera flash device for that method. 4,595,267, Cl. 354-413.000.
Kurosawa, Masaji: *See*—
Sago, Yoshiharu; Kurosawa, Masaji; and Kanamori, Nobutaka, 4,595,403, Cl. 55-389.000.
Kurozu, Shinichi: *See*—
Matsuoka, Toshio; Kurozu, Shinichi; Koyabu, Yukio; Nagayasu, Tadamitu; and Sugimori, Seiji, 4,595,574, Cl. 423-107.000.
Kuru, Hiroshi; Sakaguchi, Hirofumi; and Shiozawa, Takao, to Konishiroku Photo Ind. Co., Ltd. Recording apparatus with speed control. 4,595,279, Cl. 355-14.00R.
Kusakawa, Hideaki; and Kai, Junjiro, to Mitsubishi Denki Kabushiki Kaisha. Desalinization apparatus. 4,595,459, Cl. 202-177.000.
Kusano, Takae; and Ueno, Masato, to Molten Corp.; and Kabushiki Kaisha Four Brain. Dental prosthesis and process for preparing the same. 4,595,364, Cl. 433-185.000.
Kushnick, Steven B.; and Eichhorn, Gunther, to United States of America, Air Force. Flameholder with removable flameholder attachments. 4,594,851, Cl. 60-261.000.
Kuwajima, Hideki, to Matsushita Electric Industrial Co., Ltd. Helical scan type tape recording reproducing apparatus having a part-cylindrical drum. 4,595,961, Cl. 360-85.000.
Kuze, Katsuaki; Matsuyama, Yujiro; Maeda, Kozo; Ota, Takeshi; Kobayashi, Masahiro; Hongo, Tsuyoshi; and Makimura, Osamu, to Toyo Boseki Kabushiki Kaisha T/A Toyobo Co., Ltd.; and Nippon Magphane Kabushiki Kaisha. Oriented polyester film containing calcium carbonate and kaolinite. 4,595,715, Cl. 523-181.000.
Kuzuya, Susumu; and Imaizumi, Mamoru, to Brother Kogyo Kabushiki Kaisha. Printing apparatus with two print heads. 4,595,303, Cl. 400-82.000.
Kyker, Robert A., to EG&G Chandler Engineering Company. Pneumatic deadweight tester incorporating dampening means. 4,594,877, Cl. 73-4.00D.
Kyocera Corporation: *See*—
Nagase, Eiichi; and Watari, Shinichiro, 4,595,789, Cl. 136-244.000.
Nishiguchi, Yasuo; and Minami, Keijiro, 4,595,822, Cl. 219-216.000.
Takayama, Hiroshi; and Maruyama, Hiroshi, 4,595,665, Cl. 501-128.000.
L. & C. Steinmuller GmbH: *See*—
Pollak, Gerd; and Rabe, Gerd, 4,595,048, Cl. 165-84.000.
La Telemecanique Electrique: *See*—
Joly, Jean; and Oehlert, Yves, 4,595,250, Cl. 339-17.0LM.
Koehler, Gerard, 4,595,871, Cl. 318-696.000.
Oehlert, Yves; Neyroud, Jean; and Joly, Jean, 4,595,249, Cl. 339-17.0LM.
Labarre, Jean-Francois; Guerch, Guy; Levy, Gaston; and Sournies, Francois, to Centre National de la Recherche Scientifique (CNRS). Tricyclophosphazene derivatives, and their application as cancer chemotherapeutic drugs. 4,595,682, Cl. 514-83.000.
Laboratoires Biocodex: *See*—
Hublot, Bernard; and Levy, Rene H., 4,595,590, Cl. 424-93.000.
LaDelfe, Peter C.; and Stotlar, Suzanne C., to United States of America, Energy. Thermal sensor with an improved coating. 4,595,832, Cl. 250-338.000.
Ladkani, David; Yellin, Haim; and Weiner, Ben Z., to Teva Pharmaceutical Industries Ltd. 1'-ethoxycarbonyloxyethyl ester of valproic acid, its preparation and pharmaceutical compositions containing it. 4,595,695, Cl. 514-512.000.
LaFleur, Arnie: *See*—
LaFleur, Arthur E.; LaFleur, Arnie; and LaFleur, Lee, 4,596,040, Cl. 383-7.000.
LaFleur, Arthur E.; LaFleur, Arnie; and LaFleur, Lee, to Custom Packaging Systems. Large bulk bag. 4,596,040, Cl. 383-7.000.
LaFleur, Lee: *See*—
LaFleur, Arthur E.; LaFleur, Arnie; and LaFleur, Lee, 4,596,040, Cl. 383-7.000.
Lai, Kuo-Yann, to Colgate-Palmolive Company. High foaming nonionic surfacant based liquid detergent. 4,595,526, Cl. 252-545.000.
Lam, Philip Y. T. Case for jewelry and/or gemstones. 4,595,095, Cl. 206-45.340.
Lamarca, Guy M. Cantilevered support member and foundation unit. 4,594,825, Cl. 52-169.400.
LaMarre, Thomas M.; Martin, Cynthia H.; and Wilharm, Madelynn T., to Nalco Chemical Company. Synergistic biocide of 2-(thiocyanomethylthio) benzothiazole with a mixture of 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one. 4,595,691, Cl. 514-367.000.
Landau, Richard F.; and Majewski, Henry A., to Oerlikon-Buhrle U.S.A. Inc. Method and apparatus for plasma etching. 4,595,452, Cl. 156-643.000.
Landeau, Bernard: *See*—
Boulin, Yves; Cesario, Jean; and Landeau, Bernard, 4,595,835, Cl. 250-423.00R.
Landheer, Dolf: *See*—
Maczuszenko, Andrzej; Theodoulou, Sotos M.; Hurley, Kenneth L.; and Landheer, Dolf, 4,595,277, Cl. 355-14.00D.
Landmesser, Keith E.: *See*—
Brunelli, Timothy A.; and Landmesser, Keith E., 4,595,412, Cl. 75-0.5BB.
Landrau, Felix A.: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,595,583, Cl. 424-15.000.
Langbein, Konrad: *See*—
Stiefelmeyer, Gunther; and Langbein, Konrad, 4,595,864, Cl. 315-246.000.
Langdon, Roger M.: *See*—
Kirman, Richard G.; and Langdon, Roger M., 4,594,898, Cl. 73-778.000.
Langs, Truman H., Jr.: *See*—
DeLano, Arthur D.; and Langs, Truman H., Jr., 4,595,203, Cl. 273-148.00R.
Lapoiriere ex. spouse Vandenbossche, Claudine: *See*—
Papantoniou, Christos; Mondet, Jean; and Lapoiriere ex. spouse Vandenbossche, Claudine, 4,595,585, Cl. 424-47.000.
Lars-Olof Aberg: *See*—
Persson, Bengt, 4,594,767, Cl. 29-525.000.
Lassen, Frederich O.: *See*—
Johnson, Russell L.; and Lassen, Frederich O., 4,595,392, Cl. 604-385.00A.
Laudi, Dante A.: *See*—
Moran, Thomas M.; and Laudi, Dante A., 4,595,325, Cl. 411-173.000.
Laufer, Helmut, to Robert Bosch GmbH. Fuel injection pump. 4,594,989, Cl. 123-502.000.
Laughlin, William C.: *See*—
Baldwin, Roger A.; Kauffman, Jim W.; and Laughlin, William C., 4,595,558, Cl. 419-66.000.
Laughner, Michael K.; Porter, James R.; and Huber, Lee M., to Dow Chemical Company, The. High modulus polyurea elastomers prepared with amine-initiated polyols. 4,595,743, Cl. 528-73.000.
Laumain, Francois-Bernard, to Societe Chimique des Charbonnages, S.A. Stable prepolymers of polyisocyanate with hydroxyl functions,

a process for their manufacture and their application to the manufacture of polyurethanes. 4,595,712, Cl. 521-167.000.

Lawrance, Robert A.: *See*—
Ziegler, Theodore J.; Eydelman, Alexander; Koether, Frederick G.; and Lawrance, Robert A., 4,594,824, Cl. 52-118.000.

Lawrence, Mark A.: *See*—
Hanchett, Leland J., Jr.; and Lawrence, Mark A., 4,595,220, Cl. 292-341.170.

Lear Siegler, Inc.: *See*—
Ware, Nathan C., 4,595,216, Cl. 280-661.000.

LeBreton, Edward T.; Kepler, Arthur M.; and Groves, Clyde W., to Essef Industries, Inc. Split tank closure and diaphragm assembly. 4,595,037, Cl. 138-30.000.

Le Caer, Gerard; and Dubois, Jean-Marie, to Centre National de la Recherche Scientifique "CNRS" . Amorphous or microcrystalline aluminum-base alloys. 4,595,429, Cl. 148-403.000.

LeCompte, George W., to Hughes Aircraft Company. Shutter for radiation source of extended area. 4,595,258, Cl. 350-272.000.

Le Deit, Gerard, to Societe Anonyme D.B.A. Drum brake. 4,595,082, Cl. 188-79.50P.

Le Deit, Gerard, to Societe Anonyme D.B.A. Drum brakes. 4,595,084, Cl. 188-328.000.

Lee BioMolecular Research Laboratories, Inc.: *See*—
Kronenberg, Lee H., 4,595,653, Cl. 435-5.000.

Lee, Chang R.; Lin, Chifa F.; and Melachouris, Nicholas, to Stauffer Chemical Company. Process for preparing intensified cheese flavor product. 4,595,594, Cl. 426-35.000.

Lee, Jiin-Jen: *See*—
Raichlen, Fredric; and Lee, Jiin-Jen, 4,594,853, Cl. 60-502.000.

Lee, Shih-Yun: *See*—
Cragle, Linda K.; Harris, Paul C.; Lee, Shih-Yun; Tung, Ker-Kong; and Vodian, Morton A., 4,595,661, Cl. 436-534.000.

Lee, Wei-Kuo, to Exxon Research and Engineering Co. Device for solids and fluid handling and distribution in a magnetically stabilized fluidized bed. 4,594,794, Cl. 34-57.00A.

Lee, Woodrow W., to United States of America, Navy. Cobalt treatment of nickel composite electrode surfaces. 4,595,463, Cl. 204-2.100.

LeFevre, Daniel: *See*—
Cadars, Patrick; and LeFevre, Daniel, 4,595,051, Cl. 165-122.000.

Lefler, Harold V., III: *See*—
Fey, Kenneth C.; and Lefler, Harold V., III, 4,595,610, Cl. 428-319.300.

Legge, John R.; and Nunley, Charles E., to United Technologies Corporation. Isostatic die and method for assembly of skeletal structures. 4,595,444, Cl. 156-285.000.

Lehmacher, Hans, to Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik. Stack of detachably-connected bags with punch-out handle-grip openings and process for making same. 4,595,389, Cl. 493-227.000.

Leib, Roger K. Patient's defined-motion chair. 4,595,235, Cl. 297-294.000.

Leinders, Robert, to Medtronic, Inc. Protection circuit for implantable cardioverter. 4,595,009, Cl. 128-419.00D.

Leitch, Clifford D., to Motorola, Inc. High efficiency radio frequency signal amplifier for amplifying modulated radio frequency signals in a manner generating minimal splatter. 4,596,043, Cl. 455-91.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Smith, Todd I.; McAshan, Michael S.; and Fairbank, William M., 4,595,899, Cl. 335-216.000.

Le Marchand, Claude; and Gautier, Jean-Pierre, to Societe Anonyme D.B.A. Device for actuating a disc brake with automatic adjustment. 4,595,085, Cl. 188-71.900.

Lembke, Andreas: *See*—
Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, 4,595,593, Cl. 424-195.100.

Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik: *See*—
Lehmacher, Hans, 4,595,389, Cl. 493-227.000.

Lenchin, Julianne M.; and Bell, Harvey, to National Starch and Chemical Corporation. Batters containing high amylose flour for microwaveable pre-fried foodstuffs. 4,595,597, Cl. 426-555.000.

Lent, Arnold H.; Hinshaw, Waldo S.; and Compton, Russell A., to Technicare Corporation. Nuclear magnetic resonance flow imaging. 4,595,879, Cl. 324-309.000.

Lenze, Friedrich; and Jedamzik, Erwin, to Mannesmann Aktiengesellschaft. Gas tightly sealed joint in oil field tubular goods. 4,595,219, Cl. 285-333.000.

Lenzer, Xaver: *See*—
Wistuba, Eberhard; and Lenzer, Xaver, 4,594,841, Cl. 56-13.300.

Leone-Bay, Andrea; Weil, Edward D.; and Tomko, John, to Stauffer Chemical Company. Herbicidal esters of 2-bromo-4-methylimidazole-5-carboxylic acid. 4,595,400, Cl. 71-92.000.

Le Pargneux, Jacques: *See*—
Vere, Bernard; Mathevon, Paul; and Le Pargneux, Jacques, 4,595,815, Cl. 219-58.000.

Lerch, Ulrich: *See*—
Henning, Rainer; Lerch, Ulrich; and Kaiser, Joachim, 4,595,685, Cl. 514-225.000.

Les Cables de Lyon: *See*—
Guazzo, Lucien, 4,595,256, Cl. 350-96.210.

Les Produits Associes LPA SA: *See*—
Cuenoud, Gerard, 4,595,849, Cl. 310-36.000.
Woog, Philippe Guy E., 4,595,850, Cl. 310-47.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 5-α-bromoalkanoyl-2-oxo-3-pyridinecarbonitriles. 4,595,762, Cl. 546-288.000.

Lethellier, Patrice R., to Burroughs Corporation. Base drive circuit for a switching power transistor. 4,595,974, Cl. 363-21.000.

Leung, Wu-Hon F., to AT&T Bell Laboratories. Method of testing interfaces between computer program modules. 4,595,981, Cl. 364-300.000.

Leuze Electronic GmbH & Co.: *See*—
Stiefelmeyer, Gunther; and Langbein, Konrad, 4,595,864, Cl. 315-246.000.

Levine, James L.: *See*—
Garwin, Richard L.; and Levine, James L., 4,595,990, Cl. 364-518.000.

Levine, Michael R. Control for humidifier of the type used with thermostatically controlled furnace. 4,595,139, Cl. 236-44.00R.

Leviton Manufacturing Co., Inc.: *See*—
Doyle, Richard C.; and Rivera, Lester, 4,595,894, Cl. 335-18.000.

Levy, Gaston: *See*—
Labarre, Jean-Francois; Guerch, Guy; Levy, Gaston; and Sournies, Francois, 4,595,682, Cl. 514-83.000.

Levy, Rene H.: *See*—
Hublot, Bernard; and Levy, Rene H., 4,595,590, Cl. 424-93.000.

Lewis, Leonard K.: *See*—
Ruskin, Bryan E. S.; and Lewis, Leonard K., 4,595,131, Cl. 222-640.000.

Leybold Hearaeus GmbH: *See*—
Mahler, Peter, 4,595,483, Cl. 204-298.000.

Li Mao Sports Co., Inc.: *See*—
Tsai, Kun K., 4,595,209, Cl. 280-11.115.

Libit, Sidney M., to Owens-Illinois, Inc. Tamper evident closure cap. 4,595,123, Cl. 222-23.000.

Liburdi, Francesio: *See*—
Krob, Dennis J.; Cieniawa, Edward; and Liburdi, Francesio, 4,595,799, Cl. 179-98.000.

Lichtenberg, Richard. Hemming machine with fusing type slitter. 4,594,955, Cl. 112-147.000.

Lichti, Heinz F.: *See*—
Mardi, Shalva; Lichti, Heinz F.; Baumgartner, Guido; Garteiz, Daniel; Judd, Claude I.; and Weiner, Murray, 4,595,591, Cl. 424-127.000.

Lieber, Clement: *See*—
Webler, William E.; and Lieber, Clement, 4,595,012, Cl. 128-642.000.

Liepmann, Hans-Gunther: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,595,531, Cl. 260-239.0BD.

Lightmasters, Ltd.: *See*—
Henning, Haden V., 4,595,863, Cl. 315-208.000.

Lilly Industries Limited: *See*—
Goldsworthy, John; Marshall, Winston S.; and Verge, John P., 4,595,540, Cl. 558-414.000.

Lin, Chifa F.: *See*—
Lee, Chang R.; Lin, Chifa F.; and Melachouris, Nicholas, 4,595,594, Cl. 426-35.000.

Lin, Ching: *See*—
Wellinghoff, Stephen T.; and Lin, Ching, 4,595,609, Cl. 427-377.000.

Lin, Hsi-Tao (Steve): *See*—
Owen, Charles C.; Owen, Charles B.; and Lin, Hsi-Tao (Steve), 4,594,743, Cl. 5-111.000.

Lin, Yung-Ho, to Autry Industries, Inc. Tennis shoe construction. 4,594,799, Cl. 36-114.000.

Lin, Yung-Mao: *See*—
Autry, James C.; and Lin, Yung-Mao, 4,594,798, Cl. 36-68.000.

Lindsay Finishes, Inc.: *See*—
DuLaney, Donald C.; and Lindsay, Robert H., 4,595,415, Cl. 106-264.000.

Lindsay, Robert H.: *See*—
DuLaney, Donald C.; and Lindsay, Robert H., 4,595,415, Cl. 106-264.000.

Lindstrom, John W., to Hi-Speed Checkweigher Co., Inc. Article labeling machine. 4,595,447, Cl. 156-364.000.

Lindwall, Reine; and Samuelsson, Leif. Apparatus for contactless measurement of temperature. 4,595,299, Cl. 347-153.000.

Link, John: *See*—
Blaschke, Marilyn W.; Miller, Richard F.; and Link, John, 4,595,771, Cl. 556-77.000.
Blaschke, Marilyn W.; Miller, Richard F.; and Link, John, 4,595,772, Cl. 556-77.000.

Linke, Wolfgang: *See*—
Straub, Ferdinand; Aydin, Oral; Linke, Wolfgang; Schroeder, Gerd; and Fickeisen, Peter, 4,595,737, Cl. 526-264.000.

Linville, Kevin D.: *See*—
Ibrahim, Adel A.; Linville, Kevin D.; and Mays, Jerry E., 4,594,996, Cl. 128-1.00R.

Lionetti, Thomas A.: *See*—
Pratt, Roy E.; Lionetti, Thomas A.; and MacLean, John P., 4,595,145, Cl. 239-558.000.

Lipson, Stephen G.: *See*—
Kamil, Zvi; and Lipson, Stephen G., 4,595,900, Cl. 335-299.000.

Liston, Max D.; and Hsei, Paul K., to American Hospital Supply Corporation. Loading and transfer assembly for chemical analyzer. 4,595,562, Cl. 422-65.000.

Lithium Corporation of America, Inc.: *See*—
Morrison, Robert C.; Hall, Randy W.; and Rathman, Terry L., 4,595,779, Cl. 564-2.000.

Little, Keith W.: *See*—
Millar, Barry C.; and Little, Keith W., 4,594,907, Cl. 74-105.000.
Little, Malcolm E.: *See*—
Shoemaker, Charles J.; Scavnicky, John A.; Little, Malcolm E.; Hagy, Emily M.; and Bloom, Aaron, 4,595,003, Cl. 128-201.190.
Littlejohn, Hugh K.: *See*—
Groves, Philip R.; and Littlejohn, Hugh K., 4,595,955, Cl. 358-219.000.
Litton Systems, Inc.: *See*—
Loomer, Weston R., 4,595,332, Cl. 414-663.000.
Litvinov, Lev P.: *See*—
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.
Liu, Chih-hsiung F.; and Dicks, Lynton W. R., to Shell Oil Company. Method and apparatus for measure of heat flux through a heat exchange tube. 4,595,297, Cl. 374-29.000.
Livesay, Richard E.; and Grawey, Charles E., to Caterpillar Tractor Co. Track joint and method of assembling same. 4,594,846, Cl. 59-5.000.
Livet, Jean, to Honeywell Lucifer S.A. Solenoid valve. 4,595,170, Cl. 251-129.050.
Loacker, Arthur: *See*—
Comploi, Georg; Loacker, Arthur; Huber, Kurt; Hutter, Wilhelm; and Wallimann, Hans, 4,594,952, Cl. 112-84.000.
Lockard, Walter G.: *See*—
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; Wiatrak, Thomas R.; and Curran, Neal J., 4,595,212, Cl. 280-242.0WC.
Lockheed Missiles & Space Company, Inc.: *See*—
Ogle, Norman E., deceased, 4,595,262, Cl. 350-404.000.
Lockwood, William D. Precast concrete culvert section. 4,595,314, Cl. 405-125.000.
Loev, Bernard; and Chan, Wan-Kit, to USV Pharmaceutical Corp. Polyene compounds useful in the treatment of allergic responses. 4,595,696, Cl. 514-513.000.
Lofberg, Bo. Method and apparatus for marking the information content of an information carrying signal. 4,595,950, Cl. 358-122.000.
Lofstrand, Warren A., to Cooper Industries, Inc. Switch contact element retaining means and method of assembly. 4,595,811, Cl. 200-284.000.
Logan, Eugene T.; and Barlow, Richard A. Insulated cooking utensil. 4,595,120, Cl. 220-469.000.
Logos Export AB: *See*—
Pettersson, Stig, 4,595,240, Cl. 299-24.000.
Lohmuller, Horst: *See*—
Kalkhof, Bernd; and Lohmuller, Horst, 4,595,968, Cl. 361-152.000.
Lohstroh, Jan, to U.S. Philips Corporation. Integrated circuit. 4,595,942, Cl. 357-44.000.
Lombard, Claude; and Warenghem, Michel, to Regie Nationale des Usines Renault. Probe for measuring the level of liquid in a tank or pipe. 4,594,893, Cl. 73-304.00C.
Longney, John M.: *See*—
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.
Loomer, Weston R., to Litton Systems, Inc. Shuttle. 4,595,332, Cl. 414-663.000.
L'Oreal: *See*—
Papantoniou, Christos; Mondet, Jean; and Lapoiriere ex. spouse Vandenbossche, Claudine, 4,595,585, Cl. 424-47.000.
Lorimer, John M. Hologram imaging system and recording method. 4,595,252, Cl. 350-3.790.
Lotterbach, Gerhard: *See*—
Gloss, Erwin; Jeenicke, Edmund; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; van Woudenberg, Jan F.; and Zucker, Udo, 4,594,981, Cl. 123-424.000.
Loughran, James A.: *See*—
Anthony, Thomas R.; Houston, Douglas E.; and Loughran, James A., 4,595,428, Cl. 148-187.000.
Louth, Kenneth, to Ampex Corporation. Phase detector control for a servo system. 4,595,868, Cl. 318-608.000.
Love, Robert W.: *See*—
Bridenbaugh, John C.; and Love, Robert W., 4,595,156, Cl. 244-1.00R.
LRV Corporation: *See*—
Wagner, James A., 4,595,229, Cl. 296-39.00R.
Lu, Shih-Lai, to Minnesota Mining and Manufacturing Company. Tape closure for a can end. 4,595,114, Cl. 220-260.000.
Lucht Engineering, Inc.: *See*—
Bartz, Stephen A.; and Gunderson, Wayne D., 4,595,283, Cl. 355-73.000.
Luecke, Francis S.: *See*—
Baasch, Holger J.; Goodman, Douglas S.; Luecke, Francis S.; Soderstrom, Ronald L.; and Spiller, Eberhard A., 4,595,261, Cl. 350-394.000.
Luerken, Adolf; and Pilatowicz, Edward J., to McCulloch Corporation. Machine for comminuting waste material. 4,595,148, Cl. 241-92.000.
Luminescent Electronics, Inc.: *See*—
Simopoulos, Nicholas T.; Simopoulos, George N.; and Simopoulos, Gregory N., 4,595,861, Cl. 315-169.300.
Lumitter Industry Co., Ltd.: *See*—
Nozawa, Nobuaki; and Kondo, Koichi, 4,595,043, Cl. 160-36.000.
Lundblad, Leif. Wall-mounted apparatus for dispensing and/or depositing valuable papers. 4,595,828, Cl. 235-379.000.
Lupnitz, Gerhard: *See*—
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,594,796, Cl. 34-82.000.
Lutschg, Serge: *See*—
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Luz, Rudolf: *See*—
Slavik, Walter; and Luz, Rudolf, 4,595,151, Cl. 242-18.0DD.
Lynch, Gregory R., to Memron Inc. Transfer process for forming magnetic disk memories. 4,595,440, Cl. 156-230.000.
Lynch, Michael D. Collapsible head covering for animals. 4,594,966, Cl. 119-130.000.
Ma, Thomas T., to Ford Motor Company. Valve mechanism. 4,594,972, Cl. 123-90.240.
Mabry, Harold E.: *See*—
Vargas, Roger I.; Mabry, Harold E.; Myers, Arthur L.; and Kobayashi, Richard M., 4,594,964, Cl. 119-1.000.
MacConnell, Robert N., to Mead Corporation, The. Auxiliary keyboard. 4,595,804, Cl. 200-5.00A.
Machine Products Corporation: *See*—
Appenzeller, Robert C.; Bailey, Curtis R.; and Gable, Ronald L., 4,594,771, Cl. 29-596.000.
MacIntosh, David S.: *See*—
Coellner, James A.; MacIntosh, David S.; and Blanpied, Mark C., 4,594,860, Cl. 62-271.000.
Mack, John L. Participant-identification recording and playback system. 4,596,041, Cl. 455-53.000.
Mackenzie, Robert; and Digweed, Thomas, to WABCO Ltd. Brake actuator device having a hydraulic slack-adjusting arrangement. 4,595,083, Cl. 188-196.00C.
MacLean, John P.: *See*—
Pratt, Roy E.; Lionetti, Thomas A.; and MacLean, John P., 4,595,145, Cl. 239-558.000.
Maczuszenko, Andrzej; Theodoulou, Sotos M.; Hurley, Kenneth L.; and Landheer, Dolf. Toner supply control system. 4,595,277, Cl. 355-14.00D.
Maeda, Kozo: *See*—
Kuze, Katsuaki; Matsuyama, Yujiro; Maeda, Kozo; Ota, Takeshi; Kobayashi, Masahiro; Hongo, Tsuyoshi; and Makimura, Osamu, 4,595,715, Cl. 523-181.000.
Maeda, Masato; and Kawamura, Shuzo, to Yokogawa Hokushin Electric Corporation. Thermal conductivity detector. 4,594,879, Cl. 73-27.00R.
Magers, Ronald G. Steerable wheeled toy. 4,595,380, Cl. 446-451.000.
Magnusson, Stig E.: *See*—
Clements, John L.; and Magnusson, Stig E., 4,596,015, Cl. 371-51.000.
Magyar Vagon- es Gepgyar: *See*—
Opitz, Andor, 4,594,913, Cl. 74-711.000.
Mahler, Peter, to Leybold Hearaeus GmbH. Cathode sputtering apparatus with adjacently arranged stations. 4,595,483, Cl. 204-298.000.
Mahoney, J. Michael: *See*—
Baars, William W.; Borst, Gaylord M.; and Mahoney, J. Michael, 4,594,970, Cl. 123-73.0AD.
Maier, Franz: *See*—
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Maier, Gerhard, to Deutsche Thomson-Brandt GmbH. Input circuit for television receiver. 4,596,045, Cl. 455-189.000.
Majewski, Henry A.: *See*—
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Makimura, Osamu: *See*—
Kuze, Katsuaki; Matsuyama, Yujiro; Maeda, Kozo; Ota, Takeshi; Kobayashi, Masahiro; Hongo, Tsuyoshi; and Makimura, Osamu, 4,595,715, Cl. 523-181.000.
Malachowski, James A.: *See*—
Ower, Ronald D.; Mills, Gary L.; and Malachowski, James A., 4,594,809, Cl. 47-1.100.
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Kemble, Mern S.; and Mancusso, Matthew, 4,595,225, Cl. 294-86.410.
Mangin, Michel; and Bardet, Patrick, to Societe Lorraine de Laminage Continu-Sollac (Societe Anonyme). Method and device for supplying and controlling the layer of flux powder in a continuous casting mold. 4,595,045, Cl. 164-472.000.
Mangin, Patrick: *See*—
Prudhon, Francois; and Mangin, Patrick, 4,595,579, Cl. 423-487.000.
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Oswald, Norman D.; Franklin, Carl M.; Gutzler, Marc H.; and Mankey, Harry S., 4,595,069, Cl. 180-24.020.
Mann, Alan B.: *See*—
Bhatt, Vipul J.; Mann, Alan B.; and Coe, Stanley S., 4,595,255, Cl. 350-96.200.
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Lenze, Friedrich; and Jedamzik, Erwin, 4,595,219, Cl. 285-333.000.

Manueco Santurtun, Carlos; and Diaz Carmena, Angel, to General Electric Company. X-ray generator with phase-advance voltage feedback. 4,596,029, Cl. 378-105.000.

Manville Corporation: *See—*
Fay, Ralph M., 4,595,630, Cl. 428-288.000.

Marcamor, Inc.: *See—*
Brodbeck, Robert M., 4,595,798, Cl. 179-90.0BD.

Marceau, Philippe: *See—*
Van Damme, Henri; Fripiat, Jose J.; Nijs, Hubert; Marceau, Philippe; and Francois, Obrecht, 4,595,568, Cl. 422-186.000.

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Woo, James T. K.; Ting, Vincent W.; and Marcinko, Richard M., 4,595,716, Cl. 523-403.000.

Mardi, Shalva; Lichti, Heinz F.; Baumgartner, Guido; Garteiz, Daniel; Judd, Claude I.; and Weiner, Murray, to Solco Basel AG. Use of dilute nitric acid solutions for treating certain skin lesions. 4,595,591, Cl. 424-127.000.

Marino, Joseph A.; Puetz, Peter A.; Kling, Michael J.; Finn, Curtis A.; Pendell, John C.; and Crawford, Michael C., to Bear Automotive Service Equipment Company. Wheel alignment system. 4,594,789, Cl. 33-288.000.

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Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., 4,595,538, Cl. 260-502.560.

Marques, Michel J. M., to Cabinet Brot. Process and installation for storing objects with automated handling. 4,595,329, Cl. 414-267.000.

Marschak, Howard J. Structural panel for building structure. 4,594,822, Cl. 52-90.000.

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Goldsworthy, John; Marshall, Winston S.; and Verge, John P., 4,595,540, Cl. 558-414.000.

Martin, Cynthia H.: *See—*
LaMarre, Thomas M.; Martin, Cynthia H.; and Wilharm, Madelynn T., 4,595,691, Cl. 514-367.000.

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Martin Marietta Corporation: *See—*
Thornton, Michael G.; and Clark, Benton C., III, 4,595,561, Cl. 422-58.000.

Martin, Pierre, to Ciba-Geigy Corporation. 5-halo-1,2,3-(1,2-dihydropyrrolo)-4-quinolones. 4,595,755, Cl. 546-94.000.

Martinetti, James L.; and Katz, Allen, to RCA Corporation. Coaxial cavity resonator having a dielectric insert which impedance matches active device useable with resonator. 4,595,892, Cl. 333-218.000.

Martini, Thomas: *See—*
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Marulic, Walter J.: *See—*
Smith, Kenneth H.; and Marulic, Walter J., 4,594,948, Cl. 105-359.000.

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Takayama, Hiroshi; and Maruyama, Hiroshi, 4,595,665, Cl. 501-128.000.

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Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, 4,595,735, Cl. 526-125.000.

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Rasmussen, Russell G.; Hanson, Steven P.; and Breslow, Jeffrey D., 4,595,379, Cl. 446-341.000.
Zaruba, John V.; Morrison, Howard J.; and Conti, Rino, 4,595,099, Cl. 206-525.000.

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Maryanoff, Bruce E., to McNeilab, Inc. Hexahydropyrrolo[2,1-a]isoquinoline derivatives and antidepressant use thereof. 4,595,688, Cl. 514-285.000.

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Wolters, Norbert; Steppat, Manfred; and Bertling, Alfred, 4,594,842, Cl. 56-94.000.

Maskinfabriken Cidan A/S: *See—*
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Henson, Edwin R.; Masterson, Tipton T.; and Courtwright, Joel G., 4,595,723, Cl. 524-396.000.

Masuda, Toru, to Hosiden Electronics Co., Ltd. Switch structure comprising recessed contacts. 4,595,805, Cl. 200-6.00R.

Masuda, Youichi; and Onodera, Toshihiro, to Kabushiki Kaisha Toshiba. Switching power supply. 4,595,973, Cl. 363-18.000.

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Kawamura, Naoto; and Masuda, Yukio, 4,595,956, Cl. 358-283.000.

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Yamashita, Tsukasa; Matano, Masaharu; Mori, Kazuhiko; and Ota, Norihiro, 4,595,253, Cl. 350-96.130.

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Preiner, Gerhard; and Matejcek, Klaus, 4,595,471, Cl. 522-29.000.

Mathais, Henri: *See—*
Kervennal, Jacques; and Mathais, Henri, 4,595,744, Cl. 528-83.000.

Mathevon, Paul: *See—*
Vere, Bernard; Mathevon, Paul; and Le Pargneux, Jacques, 4,595,815, Cl. 219-58.000.

Matsubara, Tsutomu: *See—*
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Fukatsu, Yoshiaki; Kurahashi, Takashi; and Matsui, Kazuma, 4,595,866, Cl. 318-444.000.

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Matsumura, Takahiro; and Inui, Yoshiharu, to Kawasaki Jukogyo Kabushiki Kaisha; and Sumitomo Gomu Kogyo Kabushiki Kaisha. Device for clamping a tubular member. 4,595,162, Cl. 248-68.100.

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Matsuo, Naohiko, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,595,278, Cl. 355-14.00R.

Matsuo, Yoshihiro: *See—*
Wada, Takahiro; Yokotani, Fumiko; Matsuo, Yoshihiro; and Yoneno, Hiroshi, 4,595,516, Cl. 252-70.000.

Matsuoka, Takeji, to MEC Machinery Co., Ltd. Method and apparatus of manufacturing a coil spring. 4,594,869, Cl. 72-21.000.

Matsuoka, Toshio; Kurozu, Shinichi; Koyabu, Yukio; Nagayasu, Tadamitu; and Sugimori, Seiji, to Sumitomo Heavy Industries, Ltd. Method for recovering zinc from substances containing a zinc compound. 4,595,574, Cl. 423-107.000.

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Arai, Shoji; Okamoto, Izumi; and Mihata, Masayoshi, 4,595,934, Cl. 346-76.0PH.
Hirai, Kazumi; Akiyoshi, Mitsuo; Nakano, Chikao; Watanabe, Kenji; and Kodama, Satoru, 4,595,827, Cl. 219-518.000.
Kuwajima, Hideki, 4,595,961, Cl. 360-85.000.
Morita, Yasuyuki; and Sano, Reiji, 4,596,016, Cl. 372-58.000.
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, 4,595,664, Cl. 501-124.000.
Ogino, Yoshio; Mizukawa, Takumi; Ohmori, Hideki; and Yoshida, Hirokazu, 4,595,814, Cl. 219-10.770.
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Yoshikane, Tetsuo; Kagata, Akira; and Hiura, Hiromi, 4,596,009, Cl. 369-173.000.

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Koshiba, Nobuharu; Hayakawa, Hayashi; Momose, Keigo; and Ohta, Akira, 4,595,643, Cl. 429-27.000.

Matsuura, Munenori: *See—*
Itazaki, Hiroshi; Hayashi, Kunio; Matsuura, Munenori; Yonetani, Yukio; and Nakamura, Masuhisa, 4,595,767, Cl. 549-60.000.

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Matsuyama, Yujiro: *See—*
Kuze, Katsuaki; Matsuyama, Yujiro; Maeda, Kozo; Ota, Takeshi; Kobayashi, Masahiro; Hongo, Tsuyoshi; and Makimura, Osamu, 4,595,715, Cl. 523-181.000.

Mattei, Riccardo, to G.D Societa' per Azioni. Cigarette manufacturing method and machine with short tobacco distribution control. 4,595,026, Cl. 131-109.100.

Mattel, Inc.: *See—*
Sweet, Roger H.; and Mayer, Edward, 4,595,378, Cl. 446-99.000.

Matz, Klaus; Ritter, Gerhard; and Ritter, Klaus, to AVI Alpenl. Veredelungs-Industrie GmbH. Bonding unit for reinforced concrete structural components. 4,594,830, Cl. 52-334.000.

Mauldin, Charles H.: *See—*
Payne, Virgil L.; and Mauldin, Charles H., 4,595,703, Cl. 518-715.000.

Mauran, Sylvain: *See—*
Coste, Camille; Crozat, Georges; and Mauran, Sylvain, 4,595,774, Cl. 556-118.000.

Maurer, Richard P., to Monsanto Company. Thermoforming of styrenic foam laminates. 4,595,551, Cl. 264-321.000.

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Chausse, Bernard; Hellegouarc'h, Jean; and Maurice, Jean, 4,595,813, Cl. 219-10.710.

Maute, Michel: *See—*
Degobert, Paul; Maute, Michel; and Banet, Gerald, 4,594,968, Cl. 123-1.00A.

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Conrad, Hans-Jurgen; Mauz, Wolfgang; and Schildhorn, Walter, 4,595,359, Cl. 432-205.000.

May, Kenneth C. Automatic smoker's alarm apparatus. 4,595,905, Cl. 340-309.150.

Mayer, Edward: *See—*
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Mayhan, Kenneth G.; Janssen, Robert A.; and Drake, Roger F., to American Hospital Supply Corporation. Fluorocarbon grafting of polymeric substrates. 4,595,632, Cl. 428-409.000.

Mays, Alfred T., to Chicopee. Water impervious materials. 4,595,629, Cl. 428-286.000.

Mays, Jerry E.: *See—*
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Mazda Motor Corporation: *See—*
Shimoda, Shigeaki; Izuo, Masahiro; Nakao, Yuji; Shoji, Masatoshi; and Iida, Masamichi, 4,594,986, Cl. 123-491.000.

McAllister, Lawrence E.; Dietrich, Herbert; and Hill, John E., Jr., to Fiber Materials, Inc. Ablative coating composition and product. 4,595,714, Cl. 523-179.000.

McAshan, Michael S.: *See—*
Smith, Todd I.; McAshan, Michael S.; and Fairbank, William M., 4,595,899, Cl. 335-216.000.

McCallister, William O.; and Katz, Richard M., to Vectrix Corporation. Data processing technique for computer color graphic system. 4,595,917, Cl. 340-703.000.

McCandlish, Larry E.: *See—*
Ho, Teh C.; and McCandlish, Larry E., 4,595,672, Cl. 502-219.000.

McCarthy, Shaun L., to Ford Motor Company. Mass airflow sensor. 4,594,889, Cl. 73-204.000.

McCarty, Robert C.: *See—*
Holstein, John H.; McCarty, Robert C.; and Parrish, Walter G., 4,594,934, Cl. 89-129.020.

McClelland, Paul R. Fishing rod holder. 4,594,805, Cl. 43-21.200.

McClurg, Carl D., to Buckeye International, Inc. Coupler for rotary dump cars. 4,595,109, Cl. 213-62.00A.

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Frazier, John P.; McComber, Donald R.; and Nichols, Gerhard D., 4,595,387, Cl. 474-201.000.

McCreedy, Kathleen M.; Kramer, Edward J.; and Tung, Lu H., to Dow Chemical Company, The. Membranes comprising microporous structure. 4,595,707, Cl. 521-62.000.

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Luerken, Adolf; and Pilatowicz, Edward J., 4,595,148, Cl. 241-92.000.

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de Boer, Nico, 4,594,871, Cl. 72-164.000.

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Orton, George F.; and Schweickert, Thomas F., 4,595,398, Cl. 55-182.000.

McFarland, Harold L., Jr., to ELXSI. Improved terminator for high speed data bus. 4,595,923, Cl. 340-825.520.

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Baron, Samuel; and McKerlie, M. Louese, 4,595,588, Cl. 424-89.000.

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McMahon, Donald H., to Sperry Corporation. Multimode optical fiber accelerometer. 4,595,830, Cl. 250-227.000.

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Cherundolo, Michael; and McMillen, Charles A., 4,595,141, Cl. 239-230.000.

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McQueen, Robert. Crawling pest eliminator system and method. 4,594,807, Cl. 43-132.100.

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MacConnell, Robert N., 4,595,804, Cl. 200-5.00A.

MEC Machinery Co., Ltd.: *See—*
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Mecron Medizinische Produkte GmbH: *See—*
Anapliotis, Emmanuel; and Kranz, Curt, 4,595,393, Cl. 623-22.000.

Medical Magnetics, Inc.: *See—*
Blechman, Abraham; and Pescatore, Eugene A., 4,595,361, Cl. 433-18.000.

Medtronic, Inc.: *See—*
Leinders, Robert, 4,595,009, Cl. 128-419.00D.

Megy, Joseph A.: *See—*
Hard, Robert A.: and Megy, Joseph A., 4,595,413, Cl. 75-0.5BB.

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Roland, John F.; Cayle, Theodore; Dinwoodie, Robert C.; and Mehnert, David W., 4,595,659, Cl. 435-135.000.

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Pawlek, Rudolf; and Meier, Hans-Anton, 4,595,475, Cl. 204-243.00R.

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Memron Inc.: *See—*
Lynch, Gregory R., 4,595,440, Cl. 156-230.000.

Mendenhall, G. David; and Chen, Hsiang T., to Michigan Technological University, Board of Control of. Hydrocarbon fuel additives and method for preparing same. 4,595,784, Cl. 568-387.000.

Meneghini, Frank A.: *See—*
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Biftu, Tesfaye; Doebber, Thomas W.; Hwang, San-Bao; Beattie, Thomas R.; Shen, Tsung-Ying; and Stevenson, Robert, 4,595,693, Cl. 514-461.000.
Bondi, Joseph V.; and Grabowski, Lucille A., 4,594,884, Cl. 73-64.300.
Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., 4,595,750, Cl. 544-90.000.

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Siegel, Wilhelm, 4,595,217, Cl. 285-25.000.

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Kristiansen, Juan C., 4,595,052, Cl. 166-123.000.

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Jeromin, Lutz; Johannisbauer, Wilhelm; Thorausch, Klaus; Skrapac, Franjo; Hartmann, Helmut; Hentschel, Karl; and Michel, Otto, 4,595,461, Cl. 203-72.000.

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Stoner, Donald L., 4,596,022, Cl. 375-45.000.

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Endelson, Robert A., 4,595,352, Cl. 431-254.000.

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Boger, David L.; Johnson, Leighton C.; and Pugh, Jerry T., 4,595,439, Cl. 156-178.000.
Yip, Kin F.; and Rhodes, Frances F., 4,595,524, Cl. 252-408.100.

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Lu, Shih-Lai, 4,595,114, Cl. 220-260.000.
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Uchiyama, Tadamitsu; Hayashi, Toshihiro; and Osamura, Yoshinori, 4,595,191, Cl. 271-170.000.
Mintz, Donald M., to Varian Associates, Inc. Apparatus for and the method of controlling magnetron sputter device having separate confining magnetic fields to separate targets subject to separate discharges. 4,595,482, Cl. 204-298.000.
Mironova, Emilia M.: *See—*
Semenov, Pavel A.; Fedorov, Svyatoslav N.; Mironova, Emilia M.; Egorova, Eleonora V.; and Karavaev, Alexandr A., 4,595,017, Cl. 128-733.000.
Misko, Michael G. Crab trap. 4,594,804, Cl. 43-105.000.
Misra, Chanakya; and Sivakumar, Thinnalur J., to Aluminum Company of America. Boehmite production by precipitation from sodium aluminate solution at elevated temperatures. 4,595,581, Cl. 423-625.000.
Mitani, Yasuo: *See—*
Kimoto, Yutaka; Morioka, Toru; and Mitani, Yasuo, 4,594,777, Cl. 30-42.000.
Mitchell, James W.: *See—*
Quick, James R.; Golden, Craig A.; and Mitchell, James W., 4,595,611, Cl. 428-35.000.
Mitchell, Joan L.; and Anderson, Karen L., to International Business Machines Corporation. Method for converting an image from a run end or run length representation to a bit map. 4,596,039, Cl. 382-56.000.
Mitrani, Sem: *See—*
Holvoet, Marcel; Mitrani, Sem; and Pigneul, Raymond, 4,595,441, Cl. 156-265.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, 4,595,895, Cl. 335-26.000.
Itoh, Katsuaki, 4,595,806, Cl. 200-11.0TC.
Kusakawa, Hideaki; and Kai, Junjiro, 4,595,459, Cl. 202-177.000.
Shimizu, Hiroshi, 4,596,003, Cl. 365-189.000.
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; and Ueda, Atsushi, 4,594,982, Cl. 123-425.000.
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Tamaru, Shigemi; and Yamamoto, Kiyomi, 4,595,812, Cl. 200-307.000.
Wataya, Seiji; Kanno, Yoshiaki; Nishimura, Yukinobu; Shimomura, Setsuhiro; and Matsumoto, Osamu, 4,594,987, Cl. 123-494.000.
Mitsubishi Electric Corp.: *See—*
Nishiyama, Ryota; Amano, Masahiro; Seino, Shunji; Gamou, Yutaka; and Kawakami, Hidenori, 4,595,457, Cl. 162-123.000.
Mitsubishi Jidosha Kabushiki Kaisha: *See—*
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; Ueda, Atsushi; and Sasaki, Takeo, 4,594,983, Cl. 123-425.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Fujita, Akihisa, 4,594,923, Cl. 83-74.000.
Nakanishi, Kenichi; Tanabe, Seiichi; and Izumi, Jun, 4,595,642, Cl. 429-19.000.
Mitsubishi Paper Mills, Ltd.: *See—*
Nishiyama, Ryota; Amano, Masahiro; Seino, Shunji; Gamou, Yutaka; and Kawakami, Hidenori, 4,595,457, Cl. 162-123.000.
Mitsubishi Rayon Company, Ltd.: *See—*
Nakai, Yoshio; and Tateyama, Masamitsu, 4,595,728, Cl. 525-81.000.
Miura, Masakatsu: *See—*
Kubo, Seitoku; Morisawa, Kunio; and Miura, Masakatsu, 4,594,914, Cl. 74-730.000.
Miura, Masami, to NEC Corporation. Voltage controlled oscillator suited for being formed in an integrated circuit. 4,595,887, Cl. 331-8.000.
Miura, Norio: *See—*
Shimizu, Etsuo; Aoki, Yuji; Suzuki, Yujiro; and Miura, Norio, 4,595,639, Cl. 428-690.000.
Miwa, Yoshihisa; and Migita, Haruyoshi, to Sharp Kabushiki Kaisha. Translucent document cover for use in electrophotographic copying machine. 4,595,285, Cl. 355-75.000.
Miyakawa, Seii: *See—*
Takahashi, Naoki; Higuchi, Osamu; Miyakawa, Seii; Uno, Masahito; and Sato, Hiroshi, 4,595,335, Cl. 414-744.00R.
Miyake, Kayoko: *See—*
Kimura, Kazuo; Sakai, Kunihide; Inoue, Chikara; Hayashi, Hiroyuki; Takayasu, Toyoaki; Ayabe, Yasuhiro; and Miyake, Kayoko, 4,595,964, Cl. 360-125.000.
Miyazaki, Yoshihisa: *See—*
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,594,854, Cl. 60-547.100.
Miyazawa, Hiroshi: *See—*
Koizumi, Yukio; and Miyazawa, Hiroshi, 4,595,108, Cl. 212-267.000.
Miyazawa, Shintaro; and Murai, Shigeo, to Nippon Telegraph & Telephone Public Corporation; and Sumitomo Electric Industries, Ltd. Method of homogenizing a compound semiconductor crystal prior to implantation. 4,595,423, Cl. 148-1.500.
Mizukawa, Takumi: *See—*
Ogino, Yoshio; Mizukawa, Takumi; Ohmori, Hideki; and Yoshida, Hirokazu, 4,595,814, Cl. 219-10.770.
Mizuno, Kazuyoshi: *See—*
Fujimura, Kazushiro; and Mizuno, Kazuyoshi, 4,594,985, Cl. 123-489.000.
Mobil Oil Corporation: *See—*
Chu, Yung F.; Brennan, James A.; and Chester, Arthur W., 4,595,702, Cl. 518-713.000.
Hetherington, Ernest A., Jr.; and Orr, Cecil M., 4,595,831, Cl. 250-281.000.
Kaufman, William E., 4,595,300, Cl. 374-170.000.
Mochida, Shigeru; Yamada, Shunichi; and Hamanaka, Toshiyuki, to NGK Insulators, Ltd. Ceramic material for a honeycomb structure. 4,595,662, Cl. 501-15.000.
Mochizuki, Kiyofumi: *See—*
Tatekura, Koichi; Mochizuki, Kiyofumi; and Ejiri, Yoshihiro, 4,595,284, Cl. 356-73.100.
Model, Peter: *See—*
Zinder, Norman D.; Model, Peter; and Boeke, Jef D., 4,595,658, Cl. 435-68.000.
Moffatt, E. Marston, to United Technologies Corporation. Angular velocity sensor. 4,594,894, Cl. 73-515.000.
Moller, Hermann; Muschelknautz, Edgar; and Pust, Jurgen, to Johannes Moeller Hamburg GmbH & Co. KG. Device for pneumatic and hydraulic feeding of bulk goods. 4,595,317, Cl. 406-95.000.
Molten Corp.: *See—*
Kusano, Takae; and Ueno, Masato, 4,595,364, Cl. 433-185.000.
Shishido, Hideomi, 4,595,200, Cl. 273-58.00G.
Momose, Keigo: *See—*
Koshiba, Nobuharu; Hayakawa, Hayashi; Momose, Keigo; and Ohta, Akira, 4,595,643, Cl. 429-27.000.
Monarch Marking Systems, Inc.: *See—*
Derringer, Gene R., 4,595,169, Cl. 249-67.000.
Moncrieff, J. Peter. Sound reproduction system and method. 4,596,034, Cl. 381-89.000.
Mondet, Jean: *See—*
Papantoniou, Christos; Mondet, Jean; and Lapoiriere ex. spouse Vandenbossche, Claudine, 4,595,585, Cl. 424-47.000.
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., to Garrett Corporation, The. Gas turbine combustor operating method. 4,594,848, Cl. 60-39.020.
Moniotte, Philippe G.: *See—*
Devaux, Albert F. L. G.; and Moniotte, Philippe G., 4,595,721, Cl. 524-160.000.
Monogram Industries, Inc.: *See—*
Sadri, Shahriar M., 4,595,324, Cl. 411-38.000.
Monolithic Memories, Incorporated: *See—*
Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,595,875, Cl. 324-73.0PC.
Monsanto Company: *See—*
Gabbert, James D.; and Hedrick, Ross M., 4,595,746, Cl. 528-312.000.
Gabbert, James D., 4,595,747, Cl. 528-319.000.
Maurer, Richard P., 4,595,551, Cl. 264-321.000.
Morita, Eiichi, 4,595,781, Cl. 564-102.000.
Monsanto Europe, S.A.: *See—*
Devaux, Albert F. L. G.; and Moniotte, Philippe G., 4,595,721, Cl. 524-160.000.
Montagna, Angelo A.: *See—*
Tauster, Samuel J.; Montagna, Angelo A.; Steger, John J.; Fung, Shun C.; and Cross, Virginia R., 4,595,670, Cl. 502-74.000.
Montedison S.p.A.: *See—*
Venturello, Carlo; D'Aloisio, Rino; and Ricci, Marco, 4,595,671, Cl. 502-159.000.
Mookherjee, Braja D.; and Trenkle, Robert W., to International Flavors & Fragrances Inc. Composition and process for augmenting,

enhancing or imparting a leather aroma to consumable materials. 4,595,525, Cl. 252-522.00R.
Moolenaar, Antonie J.: *See*—
Houben, Jan P.; and Moolenaar, Antonie J., 4,595,851, Cl. 310-246.000.
Moran, Thomas M.; and Laudi, Dante A., to Eaton Corporation. Self-locking prevailing torque fastener. 4,595,325, Cl. 411-173.000.
Morcom, William R.; and Peters, Jeffrey D., to Harris Corporation. Reduced beta vertical transistors and method of fabrication. 4,595,943, Cl. 357-48.000.
Morduchowitz, Abraham: *See*—
Ang, Peter G. P.; Sammells, Anthony F.; and Morduchowitz, Abraham, 4,595,465, Cl. 204-59.00R.
Morelli, Marco, to SGS-ATES Componenti Elettronici S.p.A. Electronic circuit for amplitude variation and level displacement of a signal. 4,595,846, Cl. 307-490.000.
Morgenthaler, Lee N.; and Mikols, Wayne J., to Shell Oil Company. Oil base well treating fluids thickened by block copolymers. 4,595,513, Cl. 252-8.55R.
Mori, Chuzo, to Carl Manufacturing Co., Ltd. Punch having improved cutter attachment means. 4,594,927, Cl. 83-620.000.
Mori, Kazuhiko: *See*—
Yamashita, Tsukasa; Matano, Masaharu; Mori, Kazuhiko; and Ota, Norihiro, 4,595,253, Cl. 350-96.130.
Mori, Masao: *See*—
Takase, Shinji; Inoue, Akira; Omata, Tatuo; Mori, Masao; Yamazaki, Yoshihiro; and Kubo, Tatsuki, 4,595,667, Cl. 502-63.000.
Morigaki, Masakazu: *See*—
Furutachi, Nobuo; Morigaki, Masakazu; and Hirose, Takeshi, 4,595,650, Cl. 430-387.000.
Morimoto, Kiyoshi; Watanabe, Hiroshi; Tsuruoka, Yoshihisa; and Shimizu, Yukihiko, to Futaba Denshi Kogyo K.K. Graphic fluorescent display device. 4,595,862, Cl. 315-169.400.
Morimoto, Masafumi: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,595,998, Cl. 364-900.000.
Morinaga, Hisao: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,595,998, Cl. 364-900.000.
Morioka, Toru: *See*—
Kimoto, Yutaka; Morioka, Toru; and Mitani, Yasuo, 4,594,777, Cl. 30-42.000.
Morisawa, Kunio; and Kondo, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Dog clutch construction with circularly uniform construction coupling clutch sleeve and actuating piston. 4,595,087, Cl. 192-67.00R.
Morisawa, Kunio: *See*—
Kubo, Seitoku; Morisawa, Kunio; and Miura, Masakatsu, 4,594,914, Cl. 74-730.000.
Morita, Eiichi, to Monsanto Company. N,N'-dithiobisformanilides and their use in diene rubber. 4,595,781, Cl. 564-102.000.
Morita, Yasuyuki; and Sano, Reiji, to Matsushita Electric Industrial Co., Ltd. Single mode carbon dioxide gas laser oscillator having high output power. 4,596,016, Cl. 372-58.000.
Morley, Kenneth S.; Wiedenman, Gregory B.; and White, James K., to Sperry Corporation. Programmable video display character control circuit using multi-purpose RAM for display attributes, character generator, and refresh memory. 4,595,996, Cl. 364-900.000.
Morris, Keith. Table construction. 4,594,950, Cl. 108-50.000.
Morris, Robert H.: *See*—
DeBaun, Kenneth W.; and Morris, Robert H., 4,594,888, Cl. 73-198.000.
Morris, Robert J.: *See*—
Byrd, Audis C.; Morris, Robert J.; Black, Robert H.; and Weaver, Jimmie D., Jr., 4,595,566, Cl. 422-134.000.
Morris, Robert W., Jr.: *See*—
Harvey, Robert A.; and Morris, Robert W., Jr., 4,595,824, Cl. 219-302.000.
Morrison, Howard J.: *See*—
Zaruba, John V.; Morrison, Howard J.; and Conti, Rino, 4,595,099, Cl. 206-525.000.
Morrison, Robert C.; Hall, Randy W.; and Rathman, Terry L., to Lithium Corporation of America, Inc. Stable lithium diisopropylamide and method of preparation. 4,595,779, Cl. 564-2.000.
Morton Glass Works: *See*—
Abel, Donald, 4,595,132, Cl. 225-103.000.
Mosimann, David: *See*—
Ackermann, Denis, 4,595,362, Cl. 433-129.000.
Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza: *See*—
Semenov, Pavel A.; Fedorov, Svyatoslav N.; Mironova, Emilia M.; Egorova, Eleonora V.; and Karavaev, Alexandr A., 4,595,017, Cl. 128-733.000.
Mossberg, Bengt: *See*—
Jonsson, Nils A.; and Mossberg, Bengt, 4,595,208, Cl. 277-206.00R.
Mostek Corporation: *See*—
Briggs, Willard S., 4,595,845, Cl. 307-443.000.
Motorola, Inc.: *See*—
Davis, Walter L.; and DeLuca, Michael J., 4,595,972, Cl. 363-15.000.
Leitch, Clifford D., 4,596,043, Cl. 455-91.000.
Menick, Ralph E., 4,595,927, Cl. 343-390.000.
Prieto, Yolanda; and Davis, Walter L., 4,595,885, Cl. 330-303.000.
Richardson, Julian H.; and Eastmond, Bruce C., 4,596,046, Cl. 455-260.000.
Spanjer, Keith G., 4,595,647, Cl. 430-138.000.
Moulin, Norbert L., to Hughes Aircraft Company. Coupling mechanism for connectors. 4,595,251, Cl. 339-47.00R.
Mroch, Alan B.; and Westergren, Larry L., to Rockwell International Corporation. AC loop gain and DC prepositioning adjustment for phase locked loop. 4,595,886, Cl. 331-1.00A.
MTU Motoren-und Turbinen-Union Munchen GmbH: *See*—
Popp, Joachim, 4,595,207, Cl. 277-53.000.
Muchisky, Thomas P.; and Young, James V. Incentive spirometer. 4,595,196, Cl. 272-99.000.
Mucic, Vinko, to TCH Thermo-Consulting-Heidelberg GmbH. Resorption-type thermal conversion apparatus. 4,594,857, Cl. 62-141.000.
Muir, Wilson B.: *See*—
Drew, Robin A. L.; Muir, Wilson B.; and Williams, William M., 4,595,427, Cl. 148-129.000.
Muller, Karl: *See*—
Christlieb, Jan; and Muller, Karl, 4,595,342, Cl. 417-45.000.
Muller, Richard: *See*—
Schmidt, Herbert; and Muller, Richard, 4,596,019, Cl. 373-22.000.
Muncy, Floyd B. Spent shell receiver. 4,594,803, Cl. 42-1.00T.
Munz, Gerta H., Executrix: *See*—
Asher, Donald F., Jr.; Munz, Otto J., deceased; and Munz, Gerta H., Executrix, 4,594,965, Cl. 119-3.000.
Munz, Otto J., deceased: *See*—
Asher, Donald F., Jr.; Munz, Otto J., deceased; and Munz, Gerta H., Executrix, 4,594,965, Cl. 119-3.000.
Murai, Shigeo: *See*—
Miyazawa, Shintaro; and Murai, Shigeo, 4,595,423, Cl. 148-1.500.
Murai, Toshiharu: *See*—
Itoh, Tadashi; Murai, Toshiharu; Jinnai, Koichiro; Ishima, Kazumi; Koike, Takahisa; Kato, Toshifumi; and Fukazawa, Takao, 4,595,948, Cl. 358-75.000.
Murakami, Naoyuki. Apparatus for synchronizing playback rates of music sources. 4,594,930, Cl. 84-1.020.
Murakami, Takeomi; and Ishikawa, Nobuo, to Daikin Kogyo Co., Ltd.; Takeomi Murakami; and Daido Kasei Kogyo Kabushiki Kaisha. Process for treating aqueous slurry of pigment. 4,595,417, Cl. 106-309.000.
Murase, Satoru: *See*—
Shiraki, Hachio; and Murase, Satoru, 4,595,898, Cl. 335-216.000.
Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu, 4,594,845, Cl. 57-304.000.
Matsui, Isamu; Yamamoto, Yoshio; and Nakanishi, Kazuo, 4,595,152, Cl. 242-35.50A.
Murata Manufacturing Co., Ltd.: *See*—
Wakino, Kikuo; Murata, Michihiro; and Imagawa, Shunjiro, 4,595,515, Cl. 252-62.000.
Watanabe, Kohichi; and Murata, Michihiro, 4,594,758, Cl. 29-25.420.
Murata, Michihiro: *See*—
Wakino, Kikuo; Murata, Michihiro; and Imagawa, Shunjiro, 4,595,515, Cl. 252-62.000.
Watanabe, Kohichi; and Murata, Michihiro, 4,594,758, Cl. 29-25.420.
Murayama, Kenji: *See*—
Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, 4,595,701, Cl. 518-701.000.
Murdoch, James C.; and Klassen, Clarence J., to Canadian General Electric Company Limited. Apparatus for determining finished roll density in a mill. 4,594,880, Cl. 73-32.00R.
Murphy, Bryan P., to Clairol Incorporated. Process for preparing 5,6-dihydroxyindole. 4,595,765, Cl. 548-491.000.
Murphy, Guy C.; Jones, Jackie D.; and Salemme, Charles T., to General Electric Company. Method of fabricating hollow composite airfoils. 4,594,761, Cl. 29-156.80R.
Murphy, James E.; and DeTray, Ralph F. Granular and powdered material feeder/applicator. 4,595,146, Cl. 239-682.000.
Muschelknautz, Edgar: *See*—
Moller, Hermann; Muschelknautz, Edgar; and Pust, Jurgen, 4,595,317, Cl. 406-95.000.
Musil, Gerhard, to Siemens Aktiengesellschaft. Circuit arrangement for feeding electrical users with a DC voltage. 4,595,873, Cl. 323-222.000.
Mutzberg, Herman J.: *See*—
Mickelson, Maurice G.; and Mutzberg, Herman J., 4,594,815, Cl. 51-138.000.
Muzila, Cyril, to Elitex, koncern textilniho strojirenstvi. Stop spindle for textile machines. 4,594,844, Cl. 57-88.000.
Myers, Arthur L.: *See*—
Vargas, Roger I.; Mabry, Harold E.; Myers, Arthur L.; and Kobayashi, Richard M., 4,594,964, Cl. 119-1.000.
Nabisco Brands, Inc.: *See*—
Fazzolare, Richard D.; and Windmuller, Rudolf, 4,595,596, Cl. 426-549.000.
Nagano, Eiki: *See*—
Haga, Toru; Nagano, Eiki; Yoshida, Ryo; and Hashimoto, Shunichi, 4,595,409, Cl. 71-96.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Improved bicycle fork end adjuster. 4,594,787, Cl. 33-180.0AT.
Nagano, Masashi, to Shimano Industrial Company Limited. Gear crank for a bicycle. 4,594,910, Cl. 74-594.200.

Nagao, Shigeru: *See*—
Okamoto, Masakatsu; Nagao, Shigeru; and Yagi, Kazuhisa, 4,595,394, Cl. 8-139.000.

Nagaoka, Koichi: *See*—
Sugita, Nobuyuki; Kudo, Kiyoshi; and Nagaoka, Koichi, 4,595,470, Cl. 204-157.870.

Nagaraj, D. R., to American Cyanamid Company. Process for the flotation of base metal sulfide minerals in acid, neutral or mildly alkaline circuits. 4,595,493, Cl. 209-166.000.

Nagase, Eiichi; and Watari, Shinichiro, to Kyocera Corporation. Solar cell assembly. 4,595,789, Cl. 136-244.000.

Nagashima, Atsushi: *See*—
Sato, Kuniaki; Nakajima, Yasuhisa; Soeda, Naohiko; Ohta, Norio; and Nagashima, Atsushi, 4,595,357, Cl. 432-8.000.

Nagasu, Youichiro: *See*—
Tajima, Tomoyuki, 4,595,657, Cl. 435-41.000.

Nagatomi, Kazuyuki; and Sato, Rikio, to NEC Corporation. Key telephone system. 4,595,800, Cl. 179-99.00R.

Nagatsuma, Kazuyuki; Ito, Yukio; Takeuchi, Hirosi; Ashida, Sakichi; and Jyomura, Shigeru, to Hitachi, Ltd. Apparatus for and method of determining properties of saw substrates. 4,595,853, Cl. 310-313.00D.

Nagayasu, Tadamitu: *See*—
Matsuoka, Toshio; Kurozu, Shinichi; Koyabu, Yukio; Nagayasu, Tadamitu; and Sugimori, Seiji, 4,595,574, Cl. 423-107.000.

Nakai, Yoshio; and Tateyama, Masamitsu, to Mitsubishi Rayon Company, Ltd. Impact-resistant methacrylic resin composition. 4,595,728, Cl. 525-81.000.

Nakajima, Toshifumi; and Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Recording apparatus with a retractable recording head. 4,595,936, Cl. 346-139.00R.

Nakajima, Yasuhisa: *See*—
Sato, Kuniaki; Nakajima, Yasuhisa; Soeda, Naohiko; Ohta, Norio; and Nagashima, Atsushi, 4,595,357, Cl. 432-8.000.

Nakamura, Kunihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Stacking apparatus for paper sheets. 4,595,193, Cl. 271-187.000.

Nakamura, Masuhisa: *See*—
Itazaki, Hiroshi; Hayashi, Kunio; Matsuura, Munenori; Yonetani, Yukio; and Nakamura, Masuhisa, 4,595,767, Cl. 549-60.000.

Nakamura, Norihiko; and Ohnaka, Hidemi, to Toyota Jidosha Kabushiki Kaisha. Supercharger of an internal combustion engine having Roots pump. 4,594,992, Cl. 123-559.000.

Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, to Agency of Industrial Science and Technology. Process for producing aliphatic alcohols. 4,595,701, Cl. 518-701.000.

Nakamura, Taku; Hibino, Akira; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material with polymeric base precursor. 4,595,652, Cl. 430-559.000.

Nakamura, Toru, to Olympus Optical Co., Ltd. Lens system for optical recording type disks. 4,595,264, Cl. 350-480.000.

Nakane, Masami, to E. R. Squibb & Sons, Inc. 7-thiabicycloheptane substituted ethers. 4,595,692, Cl. 514-443.000.

Nakanishi Dental Mfg. Co., Ltd.: *See*—
Nakanishi, Takasuke, 4,595,363, Cl. 433-129.000.

Nakanishi, Kazuo: *See*—
Matsui, Isamu; Yamamoto, Yoshio; and Nakanishi, Kazuo, 4,595,152, Cl. 242-35.50A.

Nakanishi, Kenichi; Tanabe, Seiichi; and Izumi, Jun, to Mitsubishi Jukogyo Kabushiki Kaisha. Fuel cell composite plant. 4,595,642, Cl. 429-19.000.

Nakanishi, Takasuke, to Nakanishi Dental Mfg. Co., Ltd. Dental handpiece having means for opening and closing a chuck. 4,595,363, Cl. 433-129.000.

Nakanishi, Tosaku: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,595,998, Cl. 364-900.000.

Nakano, Chikao: *See*—
Hirai, Kazumi; Akiyoshi, Mitsuo; Nakano, Chikao; Watanabe, Kenji; and Kodama, Satoru, 4,595,827, Cl. 219-518.000.

Nakano, Tsunetomo; Yasuno, Hiroshi; and Nishio, Kazuaki, to UBE Industries, Ltd. Organic solvent-soluble photosensitive polyamide resin. 4,595,745, Cl. 528-125.000.

Nakao, Yuji: *See*—
Shimoda, Shigeaki; Izuo, Masahiro; Nakao, Yuji; Shoji, Masatoshi; and Iida, Masamichi, 4,594,986, Cl. 123-491.000.

Nakayama, Kazuaki, to Pioneer Electronic Corporation. Emitter-follower type single-ended push-pull circuit. 4,595,883, Cl. 330-255.000.

Nalco Chemical Company: *See*—
LaMarre, Thomas M.; Martin, Cynthia H.; and Wilharm, Madelynn T., 4,595,691, Cl. 514-367.000.

Nalence, Henry. Low tire pressure warning device with attached lid. 4,594,960, Cl. 116-34.00R.

Nalepa, Christopher J.; Ranken, Paul F.; and Wiegand, Karl E., to Ethyl Corporation. Di(alkylthio)diamine chain extenders for polyurethane elastomers. 4,595,742, Cl. 528-64.000.

Naruto, Shunji: *See*—
Terada, Atsusuke; Naruto, Shunji; and Iizuka, Yoshio, 4,595,699, Cl. 514-570.000.

National Research Development Corporation: *See*—
Rodger, Albert A., 4,594,885, Cl. 73-84.000.
Swinbanks, Malcolm A., 4,596,033, Cl. 381-71.000.

National Semiconductor Corporation: *See*—
Takiar, Hem P.; and Belani, Jagdish, 4,595,480, Cl. 204-297.00W.

National Starch and Chemical Corporation: *See*—
Lenchin, Julianne M.; and Bell, Harvey, 4,595,597, Cl. 426-555.000.

Nations, Joe F., to Shell Oil Company. Turbulence cementing sub. 4,595,058, Cl. 166-285.000.

Naudet, Jacky, to Societe Nationale d'Etude et de Construction de Meteurs d'Aviation S.N.E.C.M.A. Centripetal accelerator for air exhaustion in a cooling device of a gas turbine combined with the compressor disc. 4,595,339, Cl. 416-95.000.

NCR Canada Ltd.: *See*—
Brooks, Ralf M.; Vyas, Arvindkumar C.; and Connell, Brian P., 4,595,935, Cl. 346-76.0PH.

NCR Corporation: *See*—
Barnes, Ronald L., 4,595,810, Cl. 250-201.000.

Neace, James C., to United States of America, Energy. Solvent wash solution. 4,595,529, Cl. 252-631.000.

NEC Corporation: *See*—
Kubota, Keiichi, 4,595,260, Cl. 350-351.000.
Miura, Masami, 4,595,887, Cl. 331-8.000.
Nagatomi, Kazuyuki; and Sato, Rikio, 4,595,800, Cl. 179-99.00R.
Yano, Takeshi; Hori, Shinichi; Fukui, Izumu; Sato, Eiichi; and Inui, Osamu, 4,595,854, Cl. 310-317.000.

Nees, Friedbert: *See*—
Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,595,778, Cl. 560-208.000.

Neff, Willi: *See*—
Herziger, Gerd; and Neff, Willi, 4,596,030, Cl. 378-119.000.

Neiman S.A.: *See*—
Neyret, Guy, 4,594,866, Cl. 70-455.000.

Neiss, Richard W.: *See*—
Wang, An; Stapleford, Gary N.; and Neiss, Richard W., 4,595,921, Cl. 340-825.080.

Nelmark, Jack D.; and Stanke, James A., to Becor Western, Inc. Apparatus for handling drill pipes. 4,595,066, Cl. 175-85.000.

Nelsen, Randall P., to Haworth, Inc. Actuating control for seat height adjustment mechanism. 4,595,237, Cl. 297-347.000.

Nelson Industries Inc.: *See*—
Thawani, Prakash T., 4,595,073, Cl. 181-265.000.

Nelson, James A.; and Mingesz, August C., to C-R-O, Inc. Extraneous signal isolation apparatus for metal working machines. 4,595,818, Cl. 219-121.0PV.

Neogen Corporation: *See*—
Ower, Ronald D.; Mills, Gary L.; and Malachowski, James A., 4,594,809, Cl. 47-1.100.

Nesbitt Enterprises: *See*—
Nesbitt, William R., 4,594,999, Cl. 128-87.00R.

Nesbitt, William R., to Nesbitt Enterprises. Disposable cervical immobilization means. 4,594,999, Cl. 128-87.00R.

Netter, Zvi: *See*—
Fenster, Paul; Netter, Zvi; and Shimoni, Yair, 4,595,949, Cl. 358-111.000.

Nettesheim, Daniel D.: *See*—
Nettesheim, Daniel R.; Nettesheim, Daniel D.; and Carpentier, John H., 4,594,943, Cl. 101-327.000.

Nettesheim, Daniel R.; Nettesheim, Daniel D.; and Carpentier, John H., to Schwaab Inc. Ink stamp. 4,594,943, Cl. 101-327.000.

Neumann, Burkhard; and Reinheimer, Gunter, to Ernst Leitz Wetzlar GmbH. Apparatus for automatically focusing objects to be viewed in optical instruments. 4,595,829, Cl. 250-201.000.

Neurologics, Inc.: *See*—
Jones, Randolph W.; and Callahan, Alfred S., 4,595,013, Cl. 128-644.000.

Newkirk, Raymond K.; and Dickmeyer, Ronald J., to Tape, Inc. Solvent bonding process utilizing spray-mist. 4,595,446, Cl. 156-356.000.

Neyret, Guy, to Neiman S.A. Lock cylinder with a pivotable closure. 4,594,866, Cl. 70-455.000.

Neyroud, Jean: *See*—
Oehlert, Yves; Neyroud, Jean; and Joly, Jean, 4,595,249, Cl. 339-17.0LM.

NGK Insulators, Ltd.: *See*—
Mochida, Shigeru; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,595,662, Cl. 501-15.000.

Nichias Corporation: *See*—
Sago, Yoshiharu; Kurosawa, Masaji; and Kanamori, Nobutaka, 4,595,403, Cl. 55-389.000.

Nichols, Gerhard D.: *See*—
Frazier, John P.; McComber, Donald R.; and Nichols, Gerhard D., 4,595,387, Cl. 474-201.000.

Nichols, Robinson F.: *See*—
Trares, Bernard F.; and Nichols, Robinson F., 4,595,442, Cl. 156-286.000.

Nickel, Hans: *See*—
Schliemann, Harald; Wissmann, Michael; and Nickel, Hans, 4,594,780, Cl. 30-382.000.

Nielsen, Susan T.: *See*—
Schiehser, Guy A.; Nielsen, Susan T.; and Strike, Donald P., 4,595,757, Cl. 546-197.000.

Nienhaus, Clemens, to Jean Walterscheid GmbH. Telescopic shaft assembly. 4,595,383, Cl. 464-162.000.

Nigro, Louis V.: *See*—
Duval, Ernest H.; and Nigro, Louis V., 4,595,124, Cl. 222-39.000.

Nihon Kuatsu System Corp., Ltd.: *See*—
Imamura, Takumi, 4,594,881, Cl. 73-37.500.

Niimi, Masatoshi: *See*—
Azuma, Hitoshi; and Niimi, Masatoshi, 4,595,118, Cl. 220-374.000.

Nijs, Hubert: *See—*
Van Damme, Henri; Fripiat, Jose J.; Nijs, Hubert; Marceau, Philippe; and Francois, Obrecht, 4,595,568, Cl. 422-186.000.
Niki, Katsumi: *See—*
Kimura, Yasuhiro; and Niki, Katsumi, 4,595,479, Cl. 204-294.000.
Nilsson, Torsten: *See—*
Jakobsen, Kjell M.; and Nilsson, Torsten, 4,595,550, Cl. 264-292.000.
Nippo Sangyo Co. Ltd.: *See—*
Abe, Yuya; and Sawa, Toshio, 4,594,878, Cl. 73-9.000.
Nippon Electric Co., Ltd.: *See—*
Watanabe, Hiroshi; and Aoki, Eiji, 4,596,047, Cl. 455-281.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Nozue, Fusao, 4,594,932, Cl. 84-185.000.
Nippon Kogaku K.K.: *See—*
Ohki, Hiroshi; Fujii, Kenji; Ogawa, Hidehiro; and Takahama, Akio, 4,595,294, Cl. 356-375.000.
Nippon Magphane Kabushiki Kaisha: *See—*
Kuze, Katsuaki; Matsuyama, Yujiro; Maeda, Kozo; Ota, Takeshi; Kobayashi, Masahiro; Hongo, Tsuyoshi; and Makimura, Osamu, 4,595,715, Cl. 523-181.000.
Nippon Oil Co., Ltd.: *See—*
Takase, Shinji; Inoue, Akira; Omata, Tatuo; Mori, Masao; Yamazaki, Yoshihiro; and Kubo, Tatsuki, 4,595,667, Cl. 502-63.000.
Nippon Piston Ring Co., Ltd.: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,595,347, Cl. 418-173.000.
Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,595,348, Cl. 418-173.000.
Umeha, Genkichi; Urano, Shigeru; Hirakawa, Osamu; and Takeguchi, Shunsuke, 4,595,556, Cl. 419-8.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Yamaguchi, Mikio, 4,594,909, Cl. 74-493.000.
Nippon Steel Corporation: *See—*
Iwayama, Kenzo; Yoshitomi, Yasunari; and Kuroki, Katsuro, 4,595,426, Cl. 148-31.550.
Nippon Telegraph & Telephone Public Corporation: *See—*
Miyazawa, Shintaro; and Murai, Shigeo, 4,595,423, Cl. 148-1.500.
Nippon Zeon Co. Ltd.: *See—*
Yamamoto, Haruhisa; and Okumura, Kin-ichi, 4,595,788, Cl. 585-621.000.
Nippondenso Co., Ltd.: *See—*
Fukatsu, Yoshiaki; Kurahashi, Takashi; and Matsui, Kazuma, 4,595,866, Cl. 318-444.000.
Nis, John R.: *See—*
Frazee, Ralph E., Jr.; Nis, John R.; Sanchez, Joseph; Spainhour, Carroll D.; and Stawicki, Robert P., 4,594,763, Cl. 29-407.000.
Nishiguchi, Yasuo; and Minami, Keijiro, to Kyocera Corporation. Thermal head and producing process thereof. 4,595,822, Cl. 219-216.000.
Nishijima, Akihiro: *See—*
Oushiden, Hideshi; and Nishijima, Akihiro, 4,595,281, Cl. 355-51.000.
Nishimura, Susumu; and Nomura, Hiroaki, to Takeda Chemical Industries, Ltd. Thiodeazapurine derivatives. 4,595,530, Cl. 260-239.00B.
Nishimura, Yukinobu: *See—*
Wataya, Seiji; Kanno, Yoshiaki; Nishimura, Yukinobu; Shimomura, Setsuhiro; and Matsumoto, Osamu, 4,594,987, Cl. 123-494.000.
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, to Matsushita Electric Industrial Co., Ltd. Burner skeleton. 4,595,664, Cl. 501-124.000.
Nishio, Hideaki; and Shimizu, Nobuo, to Bridgestone Corporation. Pneumatic tire with lugs. 4,595,042, Cl. 152-209.00B.
Nishio, Kazuaki: *See—*
Nakano, Tsunetomo; Yasuno, Hiroshi; and Nishio, Kazuaki, 4,595,745, Cl. 528-125.000.
Nishioka, Yoshiki: *See—*
Hakaridani, Mitsuhiro; Nishioka, Yoshiki; and Iwahashi, Hiroyuki, 4,596,031, Cl. 381-43.000.
Nishiyama, Ryota; Amano, Masahiro; Seino, Shunji; Gamou, Yutaka; and Kawakami, Hidenori, to Mitsubishi Paper Mills, Ltd.; and Mitsubishi Electric Corp. Oil-impregnatable insulating board. 4,595,457, Cl. 162-123.000.
Nissan Motor Co., Ltd.: *See—*
Sugano, Kazuhiko, 4,595,088, Cl. 192-0.076.
Yamamoto, Haruo, 4,594,764, Cl. 29-430.000.
Yasuhara, Seishi, 4,594,979, Cl. 123-357.000.
Nissin Kogyo Kabushiki Kaisha: *See—*
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,594,854, Cl. 60-547.100.
Niwa, Yukichi: *See—*
Suda, Shigeyuki; Niwa, Yukichi; Ogino, Yasuo; and Ohwada, Mitsutoshi, 4,595,271, Cl. 354-403.000.
Nobuhara, Yoshiaki: *See—*
Koyama, Hideo; Hoh, Takeshi; Noguchi, Fumio; and Nobuhara, Yoshiaki, 4,594,870, Cl. 72-24.000.
Noguchi, Fumio: *See—*
Koyama, Hideo; Hoh, Takeshi; Noguchi, Fumio; and Nobuhara, Yoshiaki, 4,594,870, Cl. 72-24.000.
Noguchi, Kunio: *See—*
Shimamura, Haruo; Yatabe, Fumio; Noguchi, Kunio; and Kawanabe, Tomohiko, 4,594,977, Cl. 123-327.000.
Nomura, Hiroaki: *See—*
Nishimura, Susumu; and Nomura, Hiroaki, 4,595,530, Cl. 260-239.00B.
Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins. 4,595,735, Cl. 526-125.000.
Noord-Nederlandsche Machinefabriek b.v.: *See—*
van Os, Cornelis J., 4,594,939, Cl. 92-169.000.
Nordin, Harald E. Magazine containing retention pins for the treatment of broken and undermined teeth. 4,595,376, Cl. 433-225.000.
Nordlof, Richard D. Apparatus for straightening strip material. 4,594,872, Cl. 72-164.000.
Nordtvedt, Svein, to Bergen Patentkontor. Stocking-like escape device. 4,595,074, Cl. 182-48.000.
Norgren, Richard M.; Gray, Joe W.; and Hirschfeld, Tomas B., to United States of America, Energy. Method and apparatus for fringe-scanning chromosome analysis. 4,596,036, Cl. 382-6.000.
Norman, Eugene, to Kimberly-Clark Corporation. Electrostatic flow meter. 4,594,901, Cl. 73-861.040.
Northern Telecom Limited: *See—*
Wittman, John P., 4,595,802, Cl. 179-170.00D.
Norvell, Gordon S., to Rockwell International Corporation. Cold cathode fabrication for ring laser gyroscope. 4,595,377, Cl. 445-28.000.
Nose, Noriyuki; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Device for measuring light incident on an optical system. 4,595,290, Cl. 356-225.000.
Novak, Richard C.: *See—*
Eaton, Harry E.; and Novak, Richard C., 4,595,637, Cl. 428-608.000.
Nowak, Dieter, to Bayerische Motoren Werke AG. Switching arrangement for glow plugs of a diesel internal combustion engine. 4,594,974, Cl. 123-179.00H.
Nowicki, Casimir W., to Owens-Illinois, Inc. Labels to blow molded articles. 4,595,449, Cl. 156-444.000.
Nozawa, Nobuaki; and Kondo, Koichi, to Bunka Shutter Co., Ltd.; and Lumitter Industry Co., Ltd. Shutter device. 4,595,043, Cl. 160-36.000.
Nozue, Fusao, to Nippon Gakki Seizo Kabushiki Kaisha. Piano plate mounting structure for upright piano. 4,594,932, Cl. 84-185.000.
Nuerrenbach, Axel: *See—*
Vogel, Friedrich; Paust, Joachim; and Nuerrenbach, Axel, 4,595,783, Cl. 568-9.000.
Nunley, Charles E.: *See—*
Legge, John R.; and Nunley, Charles E., 4,595,444, Cl. 156-285.000.
Nunlist, Erwin J., to Kennecott Corporation. Sensing probe holder system. 4,595,487, Cl. 204-433.000.
Nunlist, Erwin J., to Kennecott Corporation. Method and apparatus for applying internal coatings to vessels. 4,595,614, Cl. 428-35.000.
Nunnally, H. Neal: *See—*
Higgins, Charles T.; and Nunnally, H. Neal, 4,595,027, Cl. 131-280.000.
Oakland Design Products Limited: *See—*
Williams, Ivan P., 4,594,994, Cl. 124-25.000.
O'Brien, Michael J.; Palazzolo, Francis V.; and Polachowski, Wayne T. Material storage and delivery system. 4,595,330, Cl. 414-276.000.
Occidental Oil Shale, Inc.: *See—*
Zahradnik, Raymond L.; Jacobson, Carl L.; and Shen, Jian-Chyun, 4,595,056, Cl. 166-251.000.
Occidental Research Corporation: *See—*
Hard, Robert A.; and Megy, Joseph A., 4,595,413, Cl. 75-0.5BB.
Och, Rudolf, to Frenco Verzahnungslehren GmbH. Pickup head for measuring and assembling procedures. 4,594,762, Cl. 29-281.400.
Ochiai, Michio; and Sagitani, Hiromichi, to Pola Chemical Industries, Inc. Polyglycerol compounds and cosmetic products containing the same. 4,595,537, Cl. 260-410.600.
Oda, Yukihisa: *See—*
Amano, Hiroyuki; and Oda, Yukihisa, 4,595,897, Cl. 335-205.000.
Odetics, Inc.: *See—*
Bucher, Anton M., 4,594,772, Cl. 29-603.000.
Oehlert, Yves; Neyroud, Jean; and Joly, Jean, to La Telemecanique Electrique. Receptacle for electronic cards and method of assembling the same. 4,595,249, Cl. 339-17.0LM.
Oehlert, Yves: *See—*
Joly, Jean; and Oehlert, Yves, 4,595,250, Cl. 339-17.0LM.
Oerlikon-Buhrle U.S.A. Inc.: *See—*
Landau, Richard F.; and Majewski, Henry A., 4,595,452, Cl. 156-643.000.
Oeste, Franz D.; and Kempfert, Joachim R., to Rutgerswerke Aktiengesellschaft. Process for the continuous purification of waste gases with activated carbon. 4,595,575, Cl. 423-210.000.
Oetinger, Peter L.: *See—*
Gray, Robert L., Jr.; and Oetinger, Peter L., 4,595,490, Cl. 208-310.00R.
Offutt, James C., to Rimball, Inc. Basketball game apparatus. 4,595,199, Cl. 273-1.50A.
Ogasa, Tadayoshi; and Kondo, Fumio, to Sumitomo Metal Mining Company Limited. Recovering gold and silver from an aqueous solution containing cyanic compounds of gold and silver. 4,595,572, Cl. 423-25.000.
Ogata, Masaru; Sato, Kosaburo; and Konishi, Takao, to Shionogi & Co., Ltd. Sulfonamido-benzamide derivatives. 4,595,780, Cl. 564-79.000.
Ogawa, Hidehiro: *See—*
Ohki, Hiroshi; Fujii, Kenji; Ogawa, Hidehiro; and Takahama, Akio, 4,595,294, Cl. 356-375.000.
Ogawa, Junichiro: *See—*
Kimura, Karou; and Ogawa, Junichiro, 4,594,918, Cl. 74-665.00A.
Ogino, Yasuo: *See—*
Suda, Shigeyuki; Niwa, Yukichi; Ogino, Yasuo; and Ohwada, Mitsutoshi, 4,595,271, Cl. 354-403.000.

Ogino, Yoshio; Mizukawa, Takumi; Ohmori, Hideki; and Yoshida, Hirokazu, to Matsushita Electric Industrial Co., Ltd. Induction heating apparatus utilizing output energy for powering switching operation. 4,595,814, Cl. 219-10.770.

Ogle, Barbara Ann, administratrix: *See*—
Ogle, Norman E., deceased, 4,595,262, Cl. 350-404.000.

Ogle, James A.: *See*—
Holz, George E.; and Ogle, James A., 4,595,919, Cl. 340-793.000.

Ogle, Norman E., deceased (by Ogle, Barbara Ann, administratrix), to Lockheed Missiles & Space Company, Inc. Tunable birefringent safety goggles for laser beams. 4,595,262, Cl. 350-404.000.

Ogura, Masahiko: *See*—
Watanabe, Junji; and Ogura, Masahiko, 4,595,273, Cl. 355-3.00R.

Ohashi, Hiromichi: *See*—
Yamaguchi, Yoshihiro; and Ohashi, Hiromichi, 4,595,939, Cl. 357-38.000.

Ohashi, Kazuo, to Kabushiki Kaisha Patine Shokai. Ice skating rink. 4,594,859, Cl. 62-235.000.

Ohashi, Takehisa: *See*—
Azuma, Masaaki; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,595,752, Cl. 544-258.000.

O'Hearn, Thomas P., to Interplastic Corporation. Molding compositions. 4,595,734, Cl. 525-524.000.

Ohio State University, The: *See*—
Richardson, Richard W., 4,595,820, Cl. 219-137.0PS.

Ohishi, Hirotoshi: *See*—
Fujii, Hiroshi; Fujihisa, Hiroaki; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, 4,595,895, Cl. 335-26.000.

Ohki, Hiroshi; Fujii, Kenji; Ogawa, Hidehiro; and Takahama, Akio, to Nippon Kogaku K.K. Position detecting device. 4,595,294, Cl. 356-375.000.

Ohkubo, Masahiro, to Kabushiki Kaisha Daikin Seisakusho. Power transmission mechanism with torque converter. 4,595,382, Cl. 464-82.000.

Ohmori, Hideki: *See*—
Ogino, Yoshio; Mizukawa, Takumi; Ohmori, Hideki; and Yoshida, Hirokazu, 4,595,814, Cl. 219-10.770.

Ohnaka, Hidemi: *See*—
Nakamura, Norihiko; and Ohnaka, Hidemi, 4,594,992, Cl. 123-559.000.

Ohno, Shigeru: *See*—
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,595,644, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,595,645, Cl. 430-84.000.

Ohnuki, Yukihiko: *See*—
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,595,644, Cl. 430-57.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,595,645, Cl. 430-84.000.

Ohta, Akira: *See*—
Koshiba, Nobuharu; Hayakawa, Hayashi; Momose, Keigo; and Ohta, Akira, 4,595,643, Cl. 429-27.000.

Ohta, Norio: *See*—
Sato, Kuniaki; Nakajima, Yasuhisa; Soeda, Naohiko; Ohta, Norio; and Nagashima, Atsushi, 4,595,357, Cl. 432-8.000.

Ohwada, Mitsutoshi: *See*—
Suda, Shigeyuki; Niwa, Yukichi; Ogino, Yasuo; and Ohwada, Mitsutoshi, 4,595,271, Cl. 354-403.000.

Oida, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Washing machine. 4,594,863, Cl. 68-133.000.

Oil Mining Corporation: *See*—
Ayler, Maynard F.; and Vranesh, George, 4,595,239, Cl. 299-2.000.

Okamoto, Izumi: *See*—
Arai, Shoji; Okamoto, Izumi; and Mihata, Masayoshi, 4,595,934, Cl. 346-76.0PH.

Okamoto, Masakatsu; Nagao, Shigeru; and Yagi, Kazuhisa, to Kao Corporation. Agent for improving processability of cellulose fibers: acid polymer salts for improved scouring. 4,595,394, Cl. 8-139.000.

Okamura, Naomi: *See*—
Okuno, Eiichi; Okamura, Naomi; Ozawa, Keiji; and Saitoh, Takashi, 4,595,129, Cl. 222-327.000.

Okano, Haruo: *See*—
Horioka, Keiji; Okano, Haruo; and Sekine, Makoto, 4,595,601, Cl. 427-53.100.

Okawa, Susumu; Jufuku, Yasunobu; and Okuwaki, Shigeru, to Toyota Jidosha Kabushiki Kaisha. V-belt assembly for transmitting power. 4,595,386, Cl. 474-201.000.

Okumura, Kin-ichi: *See*—
Yamamoto, Haruhisa; and Okumura, Kin-ichi, 4,595,788, Cl. 585-621.000.

Okuno, Eiichi; Okamura, Naomi; Ozawa, Keiji; and Saitoh, Takashi, to Cemedine Co., Ltd. Moistureproof sealing of a container. 4,595,129, Cl. 222-327.000.

Okuwaki, Shigeru: *See*—
Okawa, Susumu; Jufuku, Yasunobu; and Okuwaki, Shigeru, 4,595,386, Cl. 474-201.000.

Olapinski, Hans: *See*—
Krohn, Ulrich; Olapinski, Hans; and Dworak, Ulf, 4,595,663, Cl. 501-103.000.

Olin Corporation: *See*—
Butt, Sheldon H., 4,594,770, Cl. 29-588.000.
Frentzel, Richard L.; and Rosin, Michael L., 4,595,458, Cl. 162-158.000.
Smith, Warren F., Jr.; Shapiro, Eugene; and Winter, Joseph, 4,594,766, Cl. 29-460.000.

Olson, Philip D.: *See*—
Beckner, Mark W.; Davis, James A.; Gausmann, Eric J.; Hiller, Thomas L.; Olson, Philip D.; and Van Dine, Gilbert A., 4,596,010, Cl. 370-60.000.

Olszewski, Egon; Schaper, Klaus-Dieter; and Werner, Uwe, to Benteler-Werke AG. Machine for and method of chamfering of edges of plate-shaped workpieces, particularly glass disks. 4,594,814, Cl. 51-40.000.

Olympus Optical Co., Ltd.: *See*—
Nakamura, Toru, 4,595,264, Cl. 350-480.000.
Uehara, Masao; and Tanaka, Shunpei, 4,595,946, Cl. 358-29.000.

Omata, Tatuo: *See*—
Takase, Shinji; Inoue, Akira; Omata, Tatuo; Mori, Masao; Yamazaki, Yoshihiro; and Kubo, Tatsuki, 4,595,667, Cl. 502-63.000.

Omni Direct Mail Services, Ltd.: *See*—
Dickson, Richard A.; and Forrester, Allen H., 4,595,351, Cl. 425-114.000.

Omni Spectra, Inc.: *See*—
Cloutier, Donald C., 4,595,890, Cl. 333-103.000.

Omron Tateisi Electronics Co.: *See*—
Sakakiya, Yoshifumi, 4,595,985, Cl. 364-405.000.
Yamashita, Tsukasa; Matano, Masaharu; Mori, Kazuhiko; and Ota, Norihiro, 4,595,253, Cl. 350-96.130.

Ono, Takashi; and Otsubo, Kazuhiko, to Kabushiki Kaisha Komatsu Seisakusho. Hand apparatus of a robot. 4,595,333, Cl. 414-729.000.

Onodera, Toshihiro: *See*—
Masuda, Youichi; and Onodera, Toshihiro, 4,595,973, Cl. 363-18.000.

Onopchenko, Anatoli: *See*—
Bakshi, Kiran R.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,595,777, Cl. 556-478.000.

Opelika Manufacturing Corporation: *See*—
Brocklehurst, Charles E., 4,595,133, Cl. 226-34.000.

Opitz, Andor, to Magyar Vagon- es Gepgyar. Double-acting differential with slip limiting elements. 4,594,913, Cl. 74-711.000.

Orii, Shoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Power plants. 4,595,555, Cl. 376-283.000.

Orikawa, Michihiro: *See*—
Dan, Takuya; Kojima, Hiroshi; and Orikawa, Michihiro, 4,595,183, Cl. 267-140.100.

Orr, Cecil M.: *See*—
Hetherington, Ernest A., Jr.; and Orr, Cecil M., 4,595,831, Cl. 250-281.000.

Ortho Diagnostic Systems Inc.: *See*—
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Kuze, Katsuaki; Matsuyama, Yujiro; Maeda, Kozo; Ota, Takeshi; Kobayashi, Masahiro; Hongo, Tsuyoshi; and Makimura, Osamu, 4,595,715, Cl. 523-181.000.

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Ono, Takashi; and Otsubo, Kazuhiko, 4,595,333, Cl. 414-729.000.

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Wolbrink, David W.; and Otte, Dieter W., 4,594,940, Cl. 98-42.100.

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Glabiszewski, Richard, 4,595,179, Cl. 267-8.00R.

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Baars, William W.; Borst, Gaylord M.; and Mahoney, J. Michael, 4,594,970, Cl. 123-73.0AD.
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Ziegler, Theodore J.; Eydelman, Alexander; Koether, Frederick G.; and Lawrance, Robert A., 4,594,824, Cl. 52-118.000.

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Rongus, Leo P.; Overman, David L.; and Johnson, Robert N., 4,594,944, Cl. 102-221.000.

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Trumbore, David C.; and Kays, William A., 4,595,443, Cl. 156-296.000.
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Libit, Sidney M., 4,595,123, Cl. 222-23.000.
Nowicki, Casimir W., 4,595,449, Cl. 156-444.000.
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Owh, Yoon C. Envelope. 4,595,103, Cl. 206-604.000.
Oy Tampella AB: *See*—
Aario, Matti, 4,595,150, Cl. 241-282.000.
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Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,594,796, Cl. 34-82.000.
Padco, Inc.: *See*—
Goldstein, Edward J., 4,594,816, Cl. 51-393.000.
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Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.
Parcell, Louise E. Sequential keyless lock. 4,594,865, Cl. 70-313.000.
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Behme, Werner; and Berleth, Manfred, 4,594,929, Cl. 83-715.000.
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Hacias, Kenneth J., 4,595,424, Cl. 148-6.15R.
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Simmons, Harold C.; and Harding, Curtis F., 4,595,143, Cl. 239-406.000.
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Parro, Robert C., II, to Sundstrand Corporation. Inverter control. 4,595,976, Cl. 363-41.000.
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Patenaude, Richard S., to Proto-Power Corporation. Ultrasonic decontamination robot. 4,595,419, Cl. 134-1.000.
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Steiner, Hermann; Schonherr, Walter; and Helbig, Peter, 4,595,859, Cl. 313-579.000.
Patil, Prabhakar B., to Ford Motor Company. Battery state of charge gauge. 4,595,880, Cl. 324-427.000.
Patterson, George H. Device for practicing golf club swing. 4,595,204, Cl. 273-186.00A.
Patzschke, Hans-Peter; Gobel, Armin; and Klein, Klausjorg, to Herberts Gesellschaft mit beschraenkter Haftung. Aqueous electrodip lacquer coating compound capable of being deposited at the cathode, and its use. 4,595,717, Cl. 523-414.000.
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Gilles, Bernard; Roux, Raphael; and Paulet, Jose , 4,595,797, Cl. 179-84.00A.
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Vogel, Friedrich; Paust, Joachim; and Nuerrenbach, Axel, 4,595,783, Cl. 568-9.000.
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Pecci, Giancarlo; Carvani, Luigi; Valentini, Domenico; and Zaninelli, Michele, to ENI-Ente Nazionale Idrocarburi. Multistage process for the direct liquefaction of coal. 4,595,488, Cl. 208-412.000.
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Bacon, Jeffery E.; Craig, James E.; and Pedersen, Mark K., 4,595,464, Cl. 204-15.000.
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Hess, Bernhard; Brassat, Bert; and Peltzer, Bernhard, 4,595,725, Cl. 525-33.000.
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Garrelfs, Peter A.; and Young, Walter H., 4,595,355, Cl. 431-265.000.
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Marino, Joseph A.; Puetz, Peter A.; Kling, Michael J.; Finn, Curtis A.; Pendell, John C.; and Crawford, Michael C., 4,594,789, Cl. 33-288.000.
Pene, Jacques J.: *See*—
Ostroff, Gary R.; and Pene, Jacques J., 4,595,660, Cl. 435-172.300.
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Compton, Bruce J.; and Hinsvark, Orville N., 4,594,902, Cl. 73-863.230.
Davidson, Thomas A.; and Thomas, Telfer L., 4,595,759, Cl. 546-234.000.
Scopatz, Stephen D.; and Brown, Ian A., 4,595,091, Cl. 198-372.000.
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Dyer, Thomas A., 4,595,092, Cl. 198-456.000.
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Greene, Tammie B.; Townsend, David E.; and Perfetti, Thomas A., 4,595,024, Cl. 131-77.000.
Perkin-Elmer Corporation, The: *See*—
Amodeo, Ralph J.; and Krohn, William, 4,595,292, Cl. 356-346.000.
Perma Tubes Ltd.: *See*—
Goodwin, Paul, 4,595,168, Cl. 249-48.000.
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Blechman, Abraham; and Pescatore, Eugene A., 4,595,361, Cl. 433-18.000.
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Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,595,729, Cl. 525-147.000.
Peters, Jeffrey D.: *See*—
Morcom, William R.; and Peters, Jeffrey D., 4,595,943, Cl. 357-48.000.
Petrarch Systems, Inc.: *See*—
Arkles, Barry C., 4,595,775, Cl. 556-409.000.
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Knepper, J. Irvine; Garrecht, Robert J.; and Dear, George W., 4,595,523, Cl. 252-390.000.

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Pettersson, Stig, to Logos Export AB. Combined bucket and frozen soil scarifier. 4,595,240, Cl. 299-24.000.

Peynaud, Francois: *See—*
Grall, Georges; and Peynaud, Francois, 4,596,007, Cl. 367-92.000.

Pfeiffer, Martin: *See—*
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.

Pfizer Inc.: *See—*
Hamanaka, Ernest S., 4,595,539, Cl. 260-239.00A.

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Higgins, Charles T.; and Nunnally, H. Neal, 4,595,027, Cl. 131-280.000.

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Drake, Charles A., 4,595,787, Cl. 585-516.000.
Erdman, J. Gordon, 4,595,396, Cl. 44-63.000.
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., 4,595,538, Cl. 260-502.560.
Steed, Philip V., 4,595,397, Cl. 55-37.000.

Photon Chroma, Inc.: *See—*
Plumadore, John D., 4,595,276, Cl. 355-10.000.

Pie Associates: *See—*
Aubuchon, Vaughn F., 4,595,913, Cl. 340-365.00C.

Pierce, Larry D. Apparatus for cleaning chimneys. 4,594,745, Cl. 15-92.000.

Pierre, Gerard; Kordi, Mokhlis E.; and Cauquis, Georges, to Societe Francaise Hoechst. Process for preparation of glyoxylic acid through electrochemical anodic oxidation of glyoxal. 4,595,467, Cl. 204-79.000.

Piezo Electric Products, Inc.: *See—*
Kolm, Henry H.; and Carter, Robert E., 4,595,338, Cl. 416-81.000.

Pigneul, Raymond: *See—*
Holvoet, Marcel; Mitrani, Sem; and Pigneul, Raymond, 4,595,441, Cl. 156-265.000.

Pike, Ronald J., to D.A.B. Industries, Inc. Apparatus for making a brake-band. 4,595,450, Cl. 156-500.000.

Pilatowicz, Edward J.: *See—*
Luerken, Adolf; and Pilatowicz, Edward J., 4,595,148, Cl. 241-92.000.

Pioneer Electronic Corporation: *See—*
Nakayama, Kazuaki, 4,595,883, Cl. 330-255.000.

Pissiotas, Georg; and Rohr, Otto, to Ciba-Geigy Corporation. Oxime derivatives of diphenyl ethers and their use in herbicidal compositions. 4,595,410, Cl. 71-105.000.

Pitney Bowes Inc.: *See—*
Daniels, Edward P., 4,595,984, Cl. 364-466.000.

Pittway Corporation: *See—*
Siegel, Stephen L., 4,595,914, Cl. 340-515.000.

Pizzo, Joseph A., Sr.: *See—*
Schmidt, Richard; and Pizzo, Joseph A., Sr., 4,594,834, Cl. 53-117.000.

Planchamp, Claude, to Fonderies Montupet. Process for the production of composite alloys based on aluminum and boron and product thereof. 4,595,559, Cl. 420-528.000.

Planhorse International (NZ) Limited: *See—*
Spicer, Victor R., 4,594,754, Cl. 24-536.000.

Plaskolite, Inc.: *See—*
Taylor, Curtis P., 4,594,828, Cl. 52-282.000.

Plessey Overseas Limited: *See—*
Davies, Ian; and Howard, Anthony M., 4,595,603, Cl. 427-82.000.

Plettac GmbH, Stahlbau und Gesenkschmiede: *See—*
Buttgereit, Klaus, 4,595,077, Cl. 182-179.000.

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Jakobsen, Kjell M.; and Nilsson, Torsten, 4,595,550, Cl. 264-292.000.

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Hrusch, Louis C., 4,595,159, Cl. 244-104.0FP.

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Ficken, Leonard A.; Podgorny, Gerald J.; and Boyle, James A., 4,594,838, Cl. 53-471.000.

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Pola Chemical Industries, Inc.: *See—*
Ochiai, Michio; and Sagitani, Hiromichi, 4,595,537, Cl. 260-410.600.

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O'Brien, Michael J.; Palazzolo, Francis V.; and Polachowski, Wayne T., 4,595,330, Cl. 414-276.000.

Polaroid Corporation: *See—*
Arbree, Roberta R.; Foley, James W.; and Meneghini, Frank A., 4,595,764, Cl. 548-201.000.

Pollak, Gerd; and Rabe, Gerd, to L. & C. Steinmuller GmbH. Transfer of impact force onto heating or cooling surfaces, and device for effecting such transfer. 4,595,048, Cl. 165-84.000.

Pollard, Geoffrey J., to British Hydromechanics Research Assoc., The. Monitoring physical properties of a fluid. 4,594,883, Cl. 73-54.000.

Polymer-Physik GmbH & Co. KG: *See—*
Reuter, Gottfried; and Holl, Peter, 4,595,569, Cl. 422-186.000.

Pool, L. Franklin, to Dart Industries, Inc. Snap action dome switch having wire contacts. 4,595,809, Cl. 200-76.000.

Popp, Joachim, to MTU Motoren-und Turbinen-Union Munchen GmbH. Brush seal labyrinth sealing means between two machine parts. 4,595,207, Cl. 277-53.000.

Porter, Christopher H.; Giter, Gregory D.; and Pugh, Robert W., Jr., to American Medical Systems, Inc. Penile prosthesis of improved malleable construction. 4,594,998, Cl. 128-79.000.

Porter, James R.: *See—*
Laughner, Michael K.; Porter, James R.; and Huber, Lee M., 4,595,743, Cl. 528-73.000.

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Reid, Winston, 4,595,094, Cl. 206-45.140.

Post Office, Postal Headquarters: *See—*
Greathead, Thomas W., 4,595,624, Cl. 428-213.000.

Potter, William D.; and Rawlings, David A., to Smith and Nephew Associated Companies p.l.c. Surgical adhesive dressing. 4,595,001, Cl. 128-156.000.

Potthof, Erwin, to Diehl GmbH & Co. Electronic control circuit for the performing of a monostable switching function in a bistable relay. 4,595,967, Cl. 361-152.000.

Potts, Rodney M.: *See—*
Stanton, Michael; Gates, Allen P.; and Potts, Rodney M., 4,595,648, Cl. 430-162.000.

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Povzhitkov, Moysey M.: *See—*
Clark, Robin; and Povzhitkov, Moysey M., 4,595,690, Cl. 514-356.000.

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Thompson, Ralph B., 4,595,533, Cl. 260-239.30R.

Prathaftakis, George: *See—*
Froutzis, Andrew; and Prathaftakis, George, 4,595,164, Cl. 248-429.000.

Pratt, Roy E.; Lionetti, Thomas A.; and MacLean, John P., to Texaco Inc. Air distribution apparatus for a fluid catalytic cracking catalyst regenerator. 4,595,145, Cl. 239-558.000.

Preiner, Gerhard; and Matejcek, Klaus, to Wacker-Chemie GmbH. Organopolysiloxane compositions crosslinkable by ultraviolet light and a process for encapsulating electronic components. 4,595,471, Cl. 522-29.000.

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Carter, Kelly; Gallagher, Steve; Iverson, Gregory; and Krechmer, Kenneth R., 4,596,021, Cl. 375-5.000.

Prestidge, Pat A. Apparatus for attaching flashing to a roof. 4,594,818, Cl. 52-58.000.

Preston, David M.; and Soeters, Raymond A., Jr., to Eaton Corp. Supercharger rotor, shaft, and gear arrangement. 4,595,349, Cl. 418-206.000.

Previtali, Giovanni. Bag portable bicycle training apparatus. 4,595,194, Cl. 272-73.000.

Priam Corporation: *See—*
de Geus, Richard; and Grubish, James J., 4,595,221, Cl. 294-16.000.

Prieto, Yolanda; and Davis, Walter L., to Motorola, Inc. Adjustable active filter. 4,595,885, Cl. 330-303.000.

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Valori, Giuseppe; and Primati, Marco, 4,594,959, Cl. 112-460.000.

Prince Corporation: *See—*
Chu, Zooey C., 4,595,228, Cl. 296-37.700.

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Chaumel, Francisco M., 4,594,783, Cl. 33-6.000.

Procter & Gamble Company, The: *See—*
Eckstein, Joseph H., 4,595,093, Cl. 206-44.00R.

Propane Carburetion Systems, Inc.: *See—*
Batchelor, William H., 4,594,990, Cl. 123-527.000.

Propheter, Howard L., to Didde Graphic Systems Corporation. File hole punch ring apparatus for web fed paper conveying mechanism. 4,594,926, Cl. 83-345.000.

Proske, Arnost; and Weishaupt, Walter, to Bayerische Motoren Werke A.G. Anti-theft apparatus for vehicles. 4,595,902, Cl. 340-63.000.

Protecon B.F.: *See—*
Ketels, Gerardus H. J., 4,594,751, Cl. 17-1.00G.

Proto-Power Corporation: *See—*
Patenaude, Richard S., 4,595,419, Cl. 134-1.000.

Prudhon, Francois; and Mangin, Patrick, to Vicarb S.A. Process for initiating a reaction for the manufacture of synthetic hydrochloric acid. 4,595,579, Cl. 423-487.000.

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PTX-Pentronix, Inc.: *See—*
DeSantis, Raymond P., 4,594,839, Cl. 53-475.000.

Puetz, Peter A.: *See—*
Marino, Joseph A.; Puetz, Peter A.; Kling, Michael J.; Finn, Curtis A.; Pendell, John C.; and Crawford, Michael C., 4,594,789, Cl. 33-288.000.

Pugh, Jerry T.: *See—*
Boger, David L.; Johnson, Leighton C.; and Pugh, Jerry T., 4,595,439, Cl. 156-178.000.

Pugh, Robert W., Jr.: *See*—
Porter, Christopher H.; Giter, Gregory D.; and Pugh, Robert W., Jr., 4,594,998, Cl. 128-79.000.
Purex Pool Products, Inc.: *See*—
Gordbegli, Manochehr, 4,595,825, Cl. 219-306.000.
Pust, Jurgen: *See*—
Moller, Hermann; Muschelknautz, Edgar; and Pust, Jurgen, 4,595,317, Cl. 406-95.000.
Puumalainen, Pertti, to Enso-Gutzeit Oy. Procedure and means for observing streaks in the machine direction in paper or in its coating. 4,595,840, Cl. 250-572.000.
Queyroix, Christian. Horizontal endless belt vacuum filters. 4,595,501, Cl. 210-400.000.
Quick, James R.; Golden, Craig A.; and Mitchell, James W., to International Paper Company. Ink-printed ovenable food containers. 4,595,611, Cl. 428-35.000.
R. J. Reynolds Tobacco Company: *See*—
Greene, Tammie B.; Townsend, David E.; and Perfetti, Thomas A., 4,595,024, Cl. 131-77.000.
Rabe, Gerd: *See*—
Pollak, Gerd; and Rabe, Gerd, 4,595,048, Cl. 165-84.000.
Raby, Joseph S.: *See*—
King, Edward M.; Gsteiger, Kurt E.; and Raby, Joseph S., 4,595,608, Cl. 427-237.000.
Radke, John C., to Bio-Research Associates, Inc. Electrical muscle stimulator. 4,595,010, Cl. 128-421.000.
Raff, Lothar; and Wiedenmann, Hans-Martin, to Robert Bosch GmbH. Regulation device for the mixture composition of an internal combustion engine. 4,594,984, Cl. 123-440.000.
Raichlen, Fredric; and Lee, Jiin-Jen, to Wave Power Industries. Wave powered generator. 4,594,853, Cl. 60-502.000.
Rain Bird Sprinkler Mfg. Corp.: *See*—
Cherundolo, Michael; and McMillen, Charles A., 4,595,141, Cl. 239-230.000.
Raleigh Cycle Company of America: *See*—
Downing, Verlon D., 4,595,214, Cl. 280-296.000.
Rambauske, Werner, to Varo, Inc. Method and apparatus for measuring deep mirrors. 4,595,288, Cl. 356-124.000.
Ranken, Paul F.: *See*—
Nalepa, Christopher J.; Ranken, Paul F.; and Wiegand, Karl E., 4,595,742, Cl. 528-64.000.
Rantala, Borje, to Instrumentarium Corp. Method of further developing the measuring of a neuro-muscular junction. 4,595,018, Cl. 128-733.000.
Rasmussen, Russell G.; Hanson, Steven P.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Bottle driven articulated doll. 4,595,379, Cl. 446-341.000.
Rathman, Terry L.: *See*—
Morrison, Robert C.; Hall, Randy W.; and Rathman, Terry L., 4,595,779, Cl. 564-2.000.
Rathmell, William G.: *See*—
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,595,406, Cl. 71-076.000.
Rawlings, David A.: *See*—
Potter, William D.; and Rawlings, David A., 4,595,001, Cl. 128-156.000.
Raychem Corporation: *See*—
Dubrow, Robert S.; Dittmer, Catherine A.; and Uken, William D., 4,595,635, Cl. 428-447.000.
Raynolds, Stuart; and DiFilipantonio, Rudolph G., to Du Pont de Nemours, E. I., and Company. Coating fibrous substrates with fluoropolymer amphoteric polymer and surfactants. 4,595,518, Cl. 252-8.600.
Raytheon Company: *See*—
Cease, Richard G.; Favaloro, Caesar J.; and Hackendorf, James G., 4,596,026, Cl. 375-118.000.
RCA Corporation: *See*—
Avery, Leslie R., 4,595,941, Cl. 357-43.000.
Filliman, Paul D., 4,595,951, Cl. 358-147.000.
Filliman, Paul D., 4,595,952, Cl. 358-147.000.
Hale, John R., 4,595,858, Cl. 313-414.000.
Hamalainen, Kaarlo J.; and Zorbalas, George S., 4,595,960, Cl. 360-77.000.
Martinetti, James L.; and Katz, Allen, 4,595,892, Cl. 333-218.000.
Willis, Donald H., 4,595,953, Cl. 358-183.000.
Wine, Charles M., 4,595,910, Cl. 340-347.0DA.
Wu, Chung P.; and Kolondra, Frank, 4,595,837, Cl. 250-492.200.
Reanal Finomvegyszergyar: *See*—
Balogh, Gyorgy; and Csaba, Gyorgy, 4,595,582, Cl. 424-3.000.
Reckel, Rudolph P.; Harris, Joanne L.; Wellerson, Ralph, Jr.; Shaw, Sally M.; and Kaplan, Paul M., to Immunomedics Inc. Method for detecting immune complexes in serum. 4,595,654, Cl. 435-7.000.
Redhead, Harry T.; and Willans, Robert D. H. Method for cleaning electrodes. 4,595,421, Cl. 134-6.000.
Reed, John C., Jr. Method of making a removable mask Kachina doll. 4,595,432, Cl. 156-61.000.
Reed, Lockwood W. Master controller succession system for bus control access for data-communications local area networks. 4,596,012, Cl. 370-85.000.
Reed, Richard A.; and Kidd, William J. Rotating welding fixture. 4,595,186, Cl. 269-69.000.
Reed Tool Company: *See*—
Drake, Eric F., 4,595,067, Cl. 175-331.000.
Regie Nationale des Usines Renault: *See*—
Lombard, Claude; and Warenghem, Michel, 4,594,893, Cl. 73-304.00C.
Reichert, Gerhard: *See*—
Freitag, Herbert; and Reichert, Gerhard, 4,595,182, Cl. 267-120.000.
Reid, Winston, to Poseidon Maritime Services, Inc. Display stand for an ice carving or like structure. 4,595,094, Cl. 206-45.140.
Reinheimer, Gunter: *See*—
Neumann, Burkhard; and Reinheimer, Gunter, 4,595,829, Cl. 250-201.000.
Reischl, Artur, to Bayer Aktiengesellschaft. Process for the production of isocyanate polyaddition products. 4,595,709, Cl. 521-79.000.
Reischl, Artur: *See*—
Hombach, Rudolf; Dollhausen, Manfred; Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Reischl, Artur, 4,595,445, Cl. 156-307.300.
Reist, Walter, to Ferag AG. Method and apparatus for processing substantially flat products, especially printed products, unwound from a storage coil or package. 4,595,192, Cl. 271-184.000.
Reliance Electric Company: *See*—
Gehalo, David J.; and Fisher, Thomas M., 4,595,983, Cl. 364-401.000.
Reliance Products Ltd.: *See*—
Berney, Sheldon, 4,595,130, Cl. 222-539.000.
Remy, Joel: *See*—
Charbonnier, Roger; Remy, Joel; and Sauvage, Gerard, 4,595,893, Cl. 333-246.000.
Render, Tommee E. Drip edge roof moulding. 4,594,820, Cl. 52-60.000.
Renga, James M.; and Wang, Pen-Chung, to Dow Chemical Company, The. Process for preparing methyl ethers or thioethers of aryl compounds. 4,595,763, Cl. 546-290.000.
Resource Engineering and Manufacturing Corp.: *See*—
Betteridge, John W.; Hart, Milburn L.; Carlson, Gregory H.; and Carlson, Ronald E., Sr., 4,595,607, Cl. 427-185.000.
Reuter, Gottfried; and Holl, Peter, to Polymer-Physik GmbH & Co. KG. Device for desulphurizing and denitrating flue gases by electron irradiation. 4,595,569, Cl. 422-186.000.
Reynhout, Cornelis M.: *See*—
Dona, Marinus J. J.; Franken, Adrianus J. J.; Haes, Freddy; and Reynhout, Cornelis M., 4,594,778, Cl. 30-43.900.
Rezmer, Leonard D., to Game Tracker, Inc., The. Bow square. 4,594,786, Cl. 33-180.00R.
Rhee, Yong S. Method of catching flies. 4,594,808, Cl. 43-134.000.
Rhodes, Frances F.: *See*—
Yip, Kin F.; and Rhodes, Frances F., 4,595,524, Cl. 252-408.100.
Rhone-Poulenc Specialites Chimiques: *See*—
Cavezzan, Jacques, 4,595,739, Cl. 528-15.000.
Rhone Poulenc Specialties Chimiques: *See*—
Amiet, Louis; and Disdier, Camille, 4,595,541, Cl. 260-546.000.
Ricci, Marco: *See*—
Venturello, Carlo; D'Aloisio, Rino; and Ricci, Marco, 4,595,671, Cl. 502-159.000.
Richardson, Julian H.; and Eastmond, Bruce C., to Motorola, Inc. Split loop AFC system for a SSB receiver. 4,596,046, Cl. 455-260.000.
Richardson, Richard W., to Ohio State University, The. Apparatus and methods for controlling a welding process. 4,595,820, Cl. 219-137.0PS.
Richter, Artur, to Ruhrkohle Aktiengesellschaft. Sampling valve for a fixed bed reactor coal gasification plant. 4,594,904, Cl. 73-863.860.
Ricoh Company, Ltd.: *See*—
Itoh, Tadashi; Murai, Toshiharu; Jinnai, Koichiro; Ishima, Kazumi; Koike, Takahisa; Kato, Toshifumi; and Fukazawa, Takao, 4,595,948, Cl. 358-75.000.
Tanzawa, Misao; Saito, Kinzi; and Fukushima, Ichiro, 4,595,280, Cl. 355-15.000.
Tsubuko, Kazuo; and Hashimoto, Junichiro, 4,595,646, Cl. 430-115.000.
Yamazaki, Shuichi, 4,595,286, Cl. 355-77.000.
RICOH Systems, Inc.: *See*—
Mayer, Edward F., 4,595,933, Cl. 346-75.000.
Ridlen, James R.: *See*—
Bell, Gordon M.; and Ridlen, James R., 4,595,616, Cl. 428-68.000.
Rieter Machine Works, Ltd.: *See*—
Slavik, Walter; and Luz, Rudolf, 4,595,151, Cl. 242-18.0DD.
Rimball, Inc.: *See*—
Offutt, James C., 4,595,199, Cl. 273-1.50A.
Ringel, Konrad; and Vockentanz, Rainer, to Diehl GmbH & Co. Shaped charge chain with booster. 4,594,946, Cl. 102-307.000.
Ringer, Kenneth A.: *See*—
Kobus, Joseph P.; and Ringer, Kenneth A., 4,595,926, Cl. 343-368.000.
Riniker, Bernhard; Buhlmayer, Peter; and Fuhrer, Walter, to Ciba-Geigy Corporation. Substituted tetrapeptides. 4,595,677, Cl. 514-17.000.
Ritter, G. Thomas: *See*—
Gosswiller, Earl W.; and Ritter, G. Thomas, 4,595,904, Cl. 340-87.000.
Ritter, Gerhard: *See*—
Matz, Klaus; Ritter, Gerhard; and Ritter, Klaus, 4,594,830, Cl. 52-334.000.
Ritter, Klaus: *See*—
Matz, Klaus; Ritter, Gerhard; and Ritter, Klaus, 4,594,830, Cl. 52-334.000.
Ritter, Robert E.: *See*—
Du Pont, Preston S.; Freeman, Janet E.; Ritter, Robert E.; and Wittmann, Alois, 4,595,623, Cl. 428-195.000.
Rivera, Henry C. Portable food carrying device. 4,595,101, Cl. 206-545.000.

Rivera, Lester: *See*—
Doyle, Richard C.; and Rivera, Lester, 4,595,894, Cl. 335-18.000.

Rivier, Jean E. F.: *See*—
Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,595,676, Cl. 514-12.000.

Rizzoli, Ennio, to Castelli S.p.A. Articulated chair with weight responsive resilient means. 4,595,236, Cl. 297-316.000.

Rizzotti, Alfred E., III, to Ward Leonard Electric Co., Inc. Electrical control system. 4,596,049, Cl. 455-603.000.

Robbins & Craig Welding & Mfg. Co.: *See*—
Bacon, Jeffery E.; Craig, James E.; and Pedersen, Mark K., 4,595,464, Cl. 204-15.000.

Robecchi, Edoardo: *See*—
Tangorra, Giorgio; and Robecchi, Edoardo, 4,595,167, Cl. 248-638.000.

Robert Bosch GmbH: *See*—
Buchner, Norbert; Vogele, Gunter; and Wilke, Bernd, 4,595,560, Cl. 422-26.000.
Conrad, Hans-Jurgen; Mauz, Wolfgang; and Schildhorn, Walter, 4,595,359, Cl. 432-205.000.
Engel, Gerhard; Engelbrecht, Hans C.; and Wessel, Wolf, 4,594,993, Cl. 123-571.000.
Gloss, Erwin; Jeenicke, Edmund; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; van Woudenberg, Jan F.; and Zucker, Udo, 4,594,981, Cl. 123-424.000.
Kalkhof, Bernd; and Lohmuller, Horst, 4,595,968, Cl. 361-152.000.
Laufer, Helmut, 4,594,989, Cl. 123-502.000.
Raff, Lothar; and Wiedenmann, Hans-Martin, 4,594,984, Cl. 123-440.000.

Roberts, Ronald B. Liquid analyzer. 4,594,905, Cl. 73-864.630.

Robertson, James A.: *See*—
Crea, David A.; Robertson, James A.; and Keely, Jerry A., 4,595,492, Cl. 209-2.000.

Robichaux, Joseph E., Jr.: *See*—
Cognevich, Kenneth J., Sr.; and Robichaux, Joseph E., Jr., 4,595,867, Cl. 318-588.000.

Robinson, Curtiss W., to Boeing Company, The. Aircraft control surface actuation and counterbalancing. 4,595,158, Cl. 244-75.00R.

Robra, Jorg; and Goschin, Hans, to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH. Method of and a circuit arrangement for determining current criteria in the lines of a telephone system. 4,595,796, Cl. 179-18.0FA.

Rochester Gauges, Inc.: *See*—
Taylor, Carl A., 4,595,301, Cl. 374-207.000.

Rock, Erich; and Brunner, Josef, to Julius Blum Gesellschaft mbH. Fastening device for front plates of drawers or the like. 4,595,245, Cl. 312-330.00R.

Rockefeller University, The: *See*—
Zinder, Norman D.; Model, Peter; and Boeke, Jef D., 4,595,658, Cl. 435-68.000.

Rockwell International: *See*—
Krus, Werner, 4,595,619, Cl. 428-114.000.

Rockwell International Corporation: *See*—
Huffman, Charles E.; and Southerland, Stephen R., 4,595,907, Cl. 340-347.0DD.
Mroch, Alan B.; and Westergren, Larry L., 4,595,886, Cl. 331-1.00A.
Norvell, Gordon S., 4,595,377, Cl. 445-28.000.
Runyan, Wesley G., 4,595,920, Cl. 340-805.000.
Silagi, Edward G.; and Heidt, Marvin W., 4,595,882, Cl. 330-151.000.

Rodger, Albert A., to National Research Development Corporation. Apparatus for driving testing projectiles. 4,594,885, Cl. 73-84.000.

Rodrigue, Denis. Collapsible ladder assembly. 4,595,075, Cl. 182-70.000.

Rogers, Gordon W. Information processing system using optically encoded signals. 4,596,050, Cl. 455-607.000.

Rohm and Haas Company: *See*—
Martin, Frank W.; and Shahbazi, Samson, 4,595,604, Cl. 427-96.000.
Martin, Frank W.; and Shahbazi, Samson, 4,595,605, Cl. 427-96.000.
St. John, Frank; and Shahbazi, Samson, 4,595,606, Cl. 427-96.000.

Rohr, Otto: *See*—
Pissiotas, Georg; and Rohr, Otto, 4,595,410, Cl. 71-105.000.

Rohringer, Ernst, to Steuler-Industriewerke GmbH. Method for producing lining panels which are cast into concrete as an integral lining. 4,595,435, Cl. 156-73.100.

Roland, John F.; Cayle, Theodore; Dinwoodie, Robert C.; and Mehnert, David W., to Kraft, Inc. Fermentation production of ascorbic acid from L-galactonic substrate. 4,595,659, Cl. 435-135.000.

Rolf, Gerald; and Wickersheim, John C. Combination poncho and tent. 4,594,735, Cl. 2-89.000.

Rolland, Phil: *See*—
Milligan, Dennis J.; and Rolland, Phil, 4,595,706, Cl. 521-53.000.

Rolls-Royce Motors Limited: *See*—
Castell-Evans, John V., 4,595,341, Cl. 417-1.000.

Roloff, Achim; and Gschwend, Heinz W., to Ciba-Geigy Corporation. Process for the preparation of an indoline carboxylic acid. 4,595,766, Cl. 548-491.000.

Romeo, Aurelio: *See*—
della Valle, Francesco; and Romeo, Aurelio, 4,595,680, Cl. 514-77.000.

Rongus, Leo P.; Overman, David L.; and Johnson, Robert N., to United States of America, Army. Setting ring system for electronic time fuzing. 4,594,944, Cl. 102-221.000.

Rosbiegalle, Rudolf: *See*—
Schiefnetter, Harald; Meyer, Richard; and Rosbiegalle, Rudolf, 4,595,308, Cl. 401-243.000.

Rosch, Gunter: *See*—
Schonberger, Norbert; Schinzel, Erich; Martini, Thomas; and Rosch, Gunter, 4,595,756, Cl. 546-99.000.

Rosenbush, David M.: *See*—
Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., 4,595,987, Cl. 364-431.020.

Rosero, Marcelo P.: *See*—
Watkins, Bruce J.; and Rosero, Marcelo P., 4,595,053, Cl. 166-209.000.

Rosin, Michael L.: *See*—
Frentzel, Richard L.; and Rosin, Michael L., 4,595,458, Cl. 162-158.000.

Roth, Gunther, to Sunvic Regler GmbH. Electro-pneumatic converter. 4,595,029, Cl. 137-82.000.

Rothmeyer, Markus. Method and device for pumping heat. 4,594,856, Cl. 62-112.000.

Rousseau, Michel: *See*—
Chiffert, Alain; Galula, William; and Rousseau, Michel, 4,595,988, Cl. 364-483.000.

Roux, Raphael: *See*—
Gilles, Bernard; Roux, Raphael; and Paulet, Jose , 4,595,797, Cl. 179-84.00A.

Rowe, William A.; and Strauss, Paul, to Zenith Electronics Corporation. Tension mask color cathode ray tube apparatus. 4,595,857, Cl. 313-407.000.

Royal Institution for the Advancement of Learning (McGill University), The: *See*—
Drew, Robin A. L.; Muir, Wilson B.; and Williams, William M., 4,595,427, Cl. 148-129.000.

Rubach, Frederic: *See*—
Dibold, Camille; and Rubach, Frederic, 4,595,381, Cl. 446-463.000.

Ruhl, Hermann. Recorder with circuit line tamper indicating system. 4,595,932, Cl. 346-33.00R.

Ruhrkohle Aktiengesellschaft: *See*—
Richter, Artur, 4,594,904, Cl. 73-863.860.

Rukhovets, Naum: *See*—
Fertl, Walter H.; and Rukhovets, Naum, 4,594,887, Cl. 73-152.000.

Runyan, Wesley G., to Rockwell International Corporation. Low-loss sinusoidal drive system and technique. 4,595,920, Cl. 340-805.000.

Ruperto, Winfred. Jai-alai cesta. 4,595,205, Cl. 273-326.000.

Ruskin, Bryan E. S.; and Lewis, Leonard K., to Equipment Services Ltd. Beverage dispensing apparatus. 4,595,131, Cl. 222-640.000.

Russell, Barry A.; and Fettes, Ian J., to Top Off Corp. Method and apparatus for converting a hardtop vehicle to a removable top vehicle. 4,595,230, Cl. 296-102.000.

Rutgerswerke Aktiengesellschaft: *See*—
Oeste, Franz D.; and Kempfert, Joachim R., 4,595,575, Cl. 423-210.000.

Ryang, Hong-Son, to General Electric Company. Siloxane imide diols and siloxane imide organic block polymers obtained therefrom. 4,595,732, Cl. 525-417.000.

Ryczek, Lawrence J., to Eaton Corporation. Adjustable frequency on/off delay circuit. 4,595,848, Cl. 307-597.000.

S. C. Johnson & Son, Inc.: *See*—
Broadbent, David J., 4,595,679, Cl. 514-67.000.
Gipp, Mark M., 4,595,527, Cl. 252-546.000.

Saake, James T.: *See*—
Harbolt, Bruce; and Saake, James T., 4,595,350, Cl. 425-7.000.

Sabo, Brian D.: *See*—
Anderson, Walter F., Jr.; Sabo, Brian D.; Poulo, Louis R.; Wissmuller, Jan; and Fantuzzi, Joseph D., 4,595,958, Cl. 358-296.000.

Sabourin, Edward T.: *See*—
Bakshi, Kiran R.; Onopchenko, Anatoli; and Sabourin, Edward T., 4,595,777, Cl. 556-478.000.

Sadri, Shahriar M., to Monogram Industries, Inc. Impulse resistant blind fastener. 4,595,324, Cl. 411-38.000.

Safety Trim Industries, Inc.: *See*—
Steinman, Barry, 4,595,627, Cl. 428-241.000.

Sagitani, Hiromichi: *See*—
Ochiai, Michio; and Sagitani, Hiromichi, 4,595,537, Cl. 260-410.600.

Sago, Yoshiharu; Kurosawa, Masaji; and Kanamori, Nobutaka, to Toho Gas Co. Ltd.; Nichias Corporation; and Honshuseishi Kabushiki Kaisha. Heat exchange element. 4,595,403, Cl. 55-389.000.

St. Clair, Anne K.; and St. Clair, Terry L., to United States of America, National Aeronautics and Space Administration. Process for preparing essentially colorless polyimide film containing phenoxy-linked diamines. 4,595,548, Cl. 264-236.000.

St. Clair, Terry L.: *See*—
St. Clair, Anne K.; and St. Clair, Terry L., 4,595,548, Cl. 264-236.000.

St. John, Frank; and Shahbazi, Samson, to Rohm and Haas Company. Solderable conductive compositions having high adhesive strength. 4,595,606, Cl. 427-96.000.

St. John, Kenneth, to Hexcel Corporation. Medical putty for tissue augmentation. 4,595,713, Cl. 523-105.000.

Saito, Kinzi: *See*—
Tanzawa, Misao; Saito, Kinzi; and Fukushima, Ichiro, 4,595,280, Cl. 355-15.000.

Saito, Kunio: *See*—
Tashiro, Korefumi; Saito, Kunio; Takenaga, Hiroshi; and Yasunami, Masahiro, 4,596,013, Cl. 370-86.000.

Saito, Masahiko: *See*—
Aoki, Kazuharu; and Saito, Masahiko, 4,596,044, Cl. 455-189.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member of A-Si(Ge) with nonuniformly distributed nitrogen. 4,595,644, Cl. 430-57.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member having a-Ge and a-Si layers with nonuniformly distributed oxygen. 4,595,645, Cl. 430-84.000.
Saitoh, Takashi: *See*—
Okuno, Eiichi; Okamura, Naomi; Ozawa, Keiji; and Saitoh, Takashi, 4,595,129, Cl. 222-327.000.
Saji, Keiichi: *See*—
Takahashi, Hideaki; Kondo, Haruyoshi; Saji, Keiichi; Hayakawa, Kiyoharu; and Takeuchi, Takashi, 4,595,485, Cl. 204-406.000.
Sakaguchi, Hirofumi: *See*—
Kuru, Hiroshi; Sakaguchi, Hirofumi; and Shiozawa, Takao, 4,595,279, Cl. 355-14.00R.
Sakai, Kunihide: *See*—
Kimura, Kazuo; Sakai, Kunihide; Inoue, Chikara; Hayashi, Hiroyuki; Takayasu, Toyoaki; Ayabe, Yasuhiro; and Miyake, Kayoko, 4,595,964, Cl. 360-125.000.
Sakakiya, Yoshifumi, to Omron Tateisi Electronics Co. Electronic cash register. 4,595,985, Cl. 364-405.000.
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, to Nippon Piston Ring Co., Ltd. Rotary compressor. 4,595,347, Cl. 418-173.000.
Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, to Nippon Piston Ring Co., Ltd. Apparatus for supporting rotary sleeve of rotary compressor by fluid. 4,595,348, Cl. 418-173.000.
Sakamoto, Takurou: *See*—
Kamatani, Yoshio; and Sakamoto, Takurou, 4,595,741, Cl. 528-53.000.
Sakurai, Atsushi, to Canon Kabushiki Kaisha. Electronic equipment with time-based correction means that maintains the frequency of the corrected signal substantially unchanged. 4,596,032, Cl. 381-51.000.
Sakurai, Masaaki, to Canon Kabushiki Kaisha. Fixing apparatus. 4,595,274, Cl. 355-3.0FU.
Salama, Mamdouh M.; and Pan, Robert B., to Conoco Inc. Stiffening for tubular joints. 4,595,311, Cl. 403-271.000.
Salemme, Charles T.: *See*—
Murphy, Guy C.; Jones, Jackie D.; and Salemme, Charles T., 4,594,761, Cl. 29-156.80R.
Salk Institute for Biological Studies, The: *See*—
Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,595,676, Cl. 514-12.000.
Sammells, Anthony F.: *See*—
Ang, Peter G. P.; Sammells, Anthony F.; and Morduchowitz, Abraham, 4,595,465, Cl. 204-59.00R.
Samuelsson, Leif: *See*—
Lindwall, Reine; and Samuelsson, Leif, 4,595,299, Cl. 347-153.000.
San-Ai Kogyo Kabushiki Kaisha: *See*—
Kurokawa, Masahito, 4,595,166, Cl. 248-559.000.
Sanchez, Joseph: *See*—
Frazee, Ralph E., Jr.; Nis, John R.; Sanchez, Joseph; Spainhour, Carroll D.; and Stawicki, Robert P., 4,594,763, Cl. 29-407.000.
Sandhu, M. Akram: *See*—
Wu, Stephen H. W.; and Sandhu, M. Akram, 4,595,584, Cl. 424-19.000.
Sane, Ajit Y., to ELTECH Systems Corporation. Refractory metal borides and composites containing them. 4,595,545, Cl. 264-65.000.
Sankyo Company Limited: *See*—
Terada, Atsusuke; Naruto, Shunji; and Iizuka, Yoshio, 4,595,699, Cl. 514-570.000.
Sano, Reiji: *See*—
Morita, Yasuyuki; and Sano, Reiji, 4,596,016, Cl. 372-58.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Kanno, Isao, 4,594,978, Cl. 123-335.000.
Santos, Jonathan. Wing tip airfoils. 4,595,160, Cl. 244-199.000.
Sanwa Kosan Kabushiki Kaisha: *See*—
Yoshino, Zenichi, 4,595,418, Cl. 127-30.000.
Sanyo Electric Co., Ltd.: *See*—
Kimoto, Yutaka; Morioka, Toru; and Mitani, Yasuo, 4,594,777, Cl. 30-42.000.
Sarhan, Shakir: *See*—
Seiler, Nikolaus; and Sarhan, Shakir, 4,595,697, Cl. 514-534.000.
Sasaki, Takeo: *See*—
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; Ueda, Atsushi; and Sasaki, Takeo, 4,594,983, Cl. 123-425.000.
Sash Controls, Inc.: *See*—
Clancy, Joseph S.; and Heideman, Robert J., 4,594,812, Cl. 49-404.000.
Sato, Eiichi: *See*—
Yano, Takeshi; Hori, Shinichi; Fukui, Izumu; Sato, Eiichi; and Inui, Osamu, 4,595,854, Cl. 310-317.000.
Sato, Hiroshi: *See*—
Takahashi, Naoki; Higuchi, Osamu; Miyakawa, Seii; Uno, Masahito; and Sato, Hiroshi, 4,595,335, Cl. 414-744.00R.
Sato, Kosaburo: *See*—
Ogata, Masaru; Sato, Kosaburo; and Konishi, Takao, 4,595,780, Cl. 564-79.000.
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Charbonnier, Roger; Remy, Joel; and Sauvage, Gerard, 4,595,893, Cl. 333-246.000.
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Ausprung, Erich, 4,595,310, Cl. 403-77.000.
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Schlegel Corporation: *See*—
Sterner, Maurice E., Jr., 4,594,813, Cl. 49-450.000.
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Vannier, Daniel, 4,595,055, Cl. 166-241.000.
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Schmidt, Paul J.; and Crounse, Nathan N., to Hilton-Davis Chemical Co., The. 3-(substituted phenyl)phthalides. 4,595,768, Cl. 549-307.000.
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Schroeder, Alan G., to Camco, Incorporated. Well lock having retractable no-go dogs. 4,595,054, Cl. 166-217.000.
Schroeder, Gerd: *See*—
Straub, Ferdinand; Aydin, Oral; Linke, Wolfgang; Schroeder, Gerd; and Fickeisen, Peter, 4,595,737, Cl. 526-264.000.
Schultz, Sheldon. Apparatus and method for dispensing and preserving bottled degradable liquids such as wine and the like. 4,595,121, Cl. 222-1.000.
Schumacher, David D., to FSI Corporation. Carrier handle. 4,595,222, Cl. 294-16.000.
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Nettesheim, Daniel R.; Nettesheim, Daniel D.; and Carpentier, John H., 4,594,943, Cl. 101-327.000.
Schwarz, Albert J.: *See*—
Carr, John F.; Kowal, Leonard J.; and Schwarz, Albert J., 4,595,218, Cl. 285-47.000.
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Orton, George F.; and Schweickert, Thomas F., 4,595,398, Cl. 55-182.000.
Schweitzer, Leonard J. Bending machine. 4,594,875, Cl. 72-389.000.
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McNair, Rhett, 4,595,969, Cl. 362-217.000.
SCM Corporation: *See*—
Cohen, Howard J.; van der Heem, Peter; and Fitch, Steven J., 4,595,578, Cl. 423-338.000.
Woo, James T. K.; Ting, Vincent W.; and Marcinko, Richard M., 4,595,716, Cl. 523-403.000.
Scopatz, Stephen D.; and Brown, Ian A., to Pennwalt Corporation. Article diverter. 4,595,091, Cl. 198-372.000.
Scouten, Charles G., to Exxon Research and Engineering Co. Removal of phenols from phenol-containing streams. 4,595,489, Cl. 208-263.000.
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Warrick, Frank G., 4,595,035, Cl. 137-625.650.
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Seeber, Fritz. Transmission apparatus. 4,595,068, Cl. 180-9.520.
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Cianci, James P.; Jessup, James L.; and Seeley, Daniel J., 4,595,102, Cl. 206-572.000.
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Fujioka, Satoshi, 4,595,304, Cl. 400-157.200.
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Matsuura, Yoshiaki, 4,595,821, Cl. 219-216.000.
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Semenov, Pavel A.; Fedorov, Svyatoslav N.; Mironova, Emilia M.; Egorova, Eleonora V.; and Karavaev, Alexandr A., to Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza. Method for automatic processing of electro-oculographic. 4,595,017, Cl. 128-733.000.
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Yamazaki, Shunpei; and Hamatani, Toshiji, 4,595,453, Cl. 156-643.000.
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Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.
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Gater, Robert; and Pass, Peter A., 4,594,768, Cl. 29-564.000.
Setina, John R. Motor vehicle partition apparatus with longitudinally offset sections. 4,595,227, Cl. 296-24.00R.
Seybold, Anton; Gutierrez, Alejandro; Arkenberg, Pablo; and Daino, Mario, to Hoechst Aktiengesellschaft. Process for stimulating petroleum production wells. 4,595,511, Cl. 252-8.55B.
SFS Swede Filter System, Inc.: *See*—
Hellman, Goran; and Garrison, Brian E., 4,595,504, Cl. 210-519.000.
SGS-ATES Componenti Elettronici S.p.A.: *See*—
Morelli, Marco, 4,595,846, Cl. 307-490.000.
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Martin, Frank W.; and Shahbazi, Samson, 4,595,604, Cl. 427-96.000.
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St. John, Frank; and Shahbazi, Samson, 4,595,606, Cl. 427-96.000.
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Smith, Warren F., Jr.; Shapiro, Eugene; and Winter, Joseph, 4,594,766, Cl. 29-460.000.
Sharon, Andre, to International Business Machines Corporation. Robotic apparatus with improved positioning accuracy. 4,595,334, Cl. 414-735.000.
Sharp Kabushiki Kaisha: *See*—
Hakaridani, Mitsuhiro; Nishioka, Yoshiki; and Iwahashi, Hiroyuki, 4,596,031, Cl. 381-43.000.
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,595,998, Cl. 364-900.000.
Miwa, Yoshihisa; and Migita, Haruyoshi, 4,595,285, Cl. 355-75.000.
Yao, Keiji, 4,595,993, Cl. 364-708.000.
Shaw, David N., to Copeland Corporation. Highly efficient flexible two-stage refrigeration system. 4,594,858, Cl. 62-175.000.
Shaw, Sally M.: *See*—
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Shay, Robert W. Low pressure grease fitting adapted for rear hub bearings. 4,595,080, Cl. 184-105.300.
Sheffield, Herman E., to Automatic Power, Inc. Programmable control circuit for controlling the on-off operation of an indicator device. 4,595,978, Cl. 364-141.000.
Shell Oil Company: *See*—
de Haan, Simon, 4,595,353, Cl. 431-263.000.
Hoxmeier, Ronald J., 4,595,749, Cl. 528-483.000.
Liu, Chih-hsiung F.; and Dicks, Lynton W. R., 4,595,297, Cl. 374-29.000.
Morgenthaler, Lee N.; and Mikols, Wayne J., 4,595,513, Cl. 252-8.55R.
Nations, Joe F., 4,595,058, Cl. 166-285.000.
Shen, Jian-Chyun: *See*—
Zahradnik, Raymond L.; Jacobson, Carl L.; and Shen, Jian-Chyun, 4,595,056, Cl. 166-251.000.
Shen, Shannon N., to ITT Corporation. CMOS high current output driver. 4,595,844, Cl. 307-270.000.
Shen, Tsung-Ying: *See*—
Biftu, Tesfaye; Doebber, Thomas W.; Hwang, San-Bao; Beattie, Thomas R.; Shen, Tsung-Ying; and Stevenson, Robert, 4,595,693, Cl. 514-461.000.
Shene, William R.; and Brisson, Glen. Stone disintegrator. 4,595,019, Cl. 128-734.000.
Sheppard, Donald E.: *See*—
Kenison, David F.; and Sheppard, Donald E., 4,594,849, Cl. 60-39.290.
Shigenobu, Hiromichi, to Toyota Jidosha Kabushiki Kaisha. Glow plug current supply control system. 4,594,975, Cl. 123-179.00H.
Shimamura, Haruo; Yatabe, Fumio; Noguchi, Kunio; and Kawanabe, Tomohiko, to Honda Giken Kogyo Kabushiki Kaisha. Secondary air system for internal combustion engine with deceleration control. 4,594,977, Cl. 123-327.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,594,787, Cl. 33-180.0AT.
Nagano, Masashi, 4,594,910, Cl. 74-594.200.
Shimaoka, Motohiro, to Alps Electric Co., Ltd. Flexible magnetic disc driving apparatus. 4,595,963, Cl. 360-99.000.
Shimizu, Atsushi; and Ichikawa, Toshiji, to Terumo Corporation. Blood collector. 4,595,021, Cl. 128-760.000.
Shimizu Construction Co., Ltd.: *See*—
Katagiri, Kunio; Arimura, Joji; Kondo, Kazuo; and Fujise, Taisuke, 4,595,059, Cl. 166-290.000.
Shimizu, Etsuo; Aoki, Yuji; Suzuki, Yujiro; and Miura, Norio, to Kasei Optonix, Ltd. Radiographic intensifying screen. 4,595,639, Cl. 428-690.000.
Shimizu, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory. 4,596,003, Cl. 365-189.000.
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Shimizu, Yukihiko: *See*—
Morimoto, Kiyoshi; Watanabe, Hiroshi; Tsuruoka, Yoshihisa; and Shimizu, Yukihiko, 4,595,862, Cl. 315-169.400.
Shimoda, Shigeaki; Izuo, Masahiro; Nakao, Yuji; Shoji, Masatoshi; and Iida, Masamichi, to Mazda Motor Corporation. Fuel supply arrangement for internal combustion engine. 4,594,986, Cl. 123-491.000.
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Wataya, Seiji; Kanno, Yoshiaki; Nishimura, Yukinobu; Shimomura, Setsuhiro; and Matsumoto, Osamu, 4,594,987, Cl. 123-494.000.
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Koyama, Hideo; Hoh, Takeshi; Noguchi, Fumio; and Nobuhara, Yoshiaki, 4,594,870, Cl. 72-24.000.
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Ogata, Masaru; Sato, Kosaburo; and Konishi, Takao, 4,595,780, Cl. 564-79.000.
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Shishido, Hideomi, to Molten Corporation. Sound emitting ball. 4,595,200, Cl. 273-58.00G.
Shoemaker, Charles J.; Scavnicky, John A.; Little, Malcolm E.; Hagy, Emily M.; and Bloom, Aaron, to United States of America, Army. Protective mask for airborne toxic substances. 4,595,003, Cl. 128-201.190.
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Shope, James H. Tree climbing platform. 4,595,079, Cl. 182-187.000.
Shore, Daniel B., to J. I. Case Company. Pressure relieved piston rod seal. 4,594,938, Cl. 92-82.000.
Shutt, Thomas C. Methods for producing fire retardant cellulosic products. 4,595,414, Cl. 106-18.160.
Sidles, James: *See—*
Blayne, Jerome J.; Sidles, James; and Bartley, Donald R., 4,595,553, Cl. 264-501.000.
Siegel, Stephen L., to Pittway Corporation. Self-testing combustion products detector. 4,595,914, Cl. 340-515.000.
Siegel, Wilhelm, to Merck Patent Gesellschaft mit beschrankter Haftung. Coupling member for vessels for use in two-way extraction systems. 4,595,217, Cl. 285-25.000.
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Huber, Anton; and Tihanyi, Jeno , 4,595,966, Cl. 361-93.000.
Musil, Gerhard, 4,595,873, Cl. 323-222.000.
Schorr, Wolfgang, 4,595,022, Cl. 128-777.000.
Vangaever, Frank; and Vanhumbeeck, Jacky, 4,595,462, Cl. 204-1.00T.
Siemens-Allis, Inc.: *See—*
DiMarco, Bernard; and Stanford, Charles W., 4,595,896, Cl. 335-202.000.
Siesta Corp.: *See—*
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Signetics Corporation: *See—*
Ellwanger, Russell C., 4,594,769, Cl. 29-578.000.
Silagi, Edward G.; and Heidt, Marvin W., to Rockwell International Corporation. Phase adjusted feedforward error correction. 4,595,882, Cl. 330-151.000.
Silcott, Edward N.: *See—*
Hall, Richard L.; Jenniches, Frieda S.; Kehoe, James R.; Strong, David G.; and Silcott, Edward N., 4,595,816, Cl. 219-121.0LD.
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Simmons, Harold C.; and Harding, Curtis F., to Parker-Hannifin Corporation. Air swirl nozzle. 4,595,143, Cl. 239-406.000.
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Simopoulos, Nicholas T.; Simopoulos, George N.; and Simopoulos, Gregory N., to Luminescent Electronics, Inc. Power supplies for electroluminescent panels. 4,595,861, Cl. 315-169.300.
Simpson, Lewis H. Portable desk-work bench with carrying case. 4,595,086, Cl. 190-11.000.
Simpson, Robert A., to International Business Machines Corporation. Alignment correction technique. 4,595,836, Cl. 250-491.100.
Singer Company, The: *See—*
Vartoukian, Artin G.; and Haggerty, Robert P., 4,594,956, Cl. 112-262.100.
Singh, Baldev: *See—*
Lesher, George Y.; and Singh, Baldev, 4,595,762, Cl. 546-288.000.
Sinnadurai, F. Nihal; Cook, Anthony J.; and Gurnett, Keith W., to British Telecommunications. Integrated circuit chip carrier. 4,595,096, Cl. 206-331.000.
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Misra, Chanakya; and Sivakumar, Thinnalur J., 4,595,581, Cl. 423-625.000.
Skil Nederland B.V.: *See—*
Houben, Jan P.; and Moolenaar, Antonie J., 4,595,851, Cl. 310-246.000.
Skrapac, Franjo: *See—*
Jeromin, Lutz; Johannisbauer, Wilhelm; Thorausch, Klaus; Skrapac, Franjo; Hartmann, Helmut; Hentschel, Karl; and Michel, Otto, 4,595,461, Cl. 203-72.000.
Slavik, Walter; and Luz, Rudolf, to Rieter Machine Works, Ltd. Bobbin inserting device. 4,595,151, Cl. 242-18.0DD.
Sloma, David J.: *See—*
Bouchard, Donald R.; Danton, John L.; Dawson, Kevin A.; and Sloma, David J., 4,596,037, Cl. 382-8.000.
Small, Mark, to Brunswick Corp. Integral valve and cylinder assembly for power steered marine drive. 4,595,370, Cl. 440-53.000.
Smith, Clarence F., Jr.: *See—*
Glenn, Holt E.; and Smith, Clarence F., Jr., 4,595,232, Cl. 297-17.000.
Smith, David E. Breech locking system for self loading fire arms. 4,594,935, Cl. 89-176.000.
Smith, Earl J. Lubricating and additive mixtures for alcohol fuels and their method of preparation. 4,595,395, Cl. 44-51.000.
Smith, Gary F.: *See—*
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,595,729, Cl. 525-147.000.
Smith, Kenneth H.; and Marulic, Walter J., to Thrall Car Manufacturing Company. Liquid and solid dual lading railroad car. 4,594,948, Cl. 105-359.000.
Smith and Nephew Associated Companies p.l.c.: *See—*
Potter, William D.; and Rawlings, David A., 4,595,001, Cl. 128-156.000.
Smith, Todd I.; McAshan, Michael S.; and Fairbank, William M., to Leland Stanford Junior University, The Board of Trustees of the. Magnetic structure for NMR applications and the like. 4,595,899, Cl. 335-216.000.
Smith, Warren F., Jr.; Shapiro, Eugene; and Winter, Joseph, to Olin Corporation. Optical fiber cables having improved hermeticity. 4,594,766, Cl. 29-460.000.
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Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.
Smyth, Robert R.: *See—*
Daubenspeck, Ronald E.; Smyth, Robert R.; and Speranza, Donald, 4,595,986, Cl. 364-424.100.
Snaper, Alvin A. Integral water sensing and detecting device. 4,595,916, Cl. 340-604.000.
Snow, Barton H.; and Stockton, William W., to General Electric Company. Aircraft engine control. 4,594,852, Cl. 60-38.281.
Snyder, Fred L.; and Blank, Merle L., to United States of America, Energy. Antihypertensive neutral lipid. 4,595,681, Cl. 514-77.000.
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Le Deit, Gerard, 4,595,082, Cl. 188-79.50P.
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Le Marchand, Claude; and Gautier, Jean-Pierre, 4,595,085, Cl. 188-71.900.
Meynier, Guy; and Thioux, Alain, 4,594,937, Cl. 91-369.00R.
Societe Chimique des Charbonnages, S.A.: *See—*
Laumain, Francois-Bernard, 4,595,712, Cl. 521-167.000.
Societe Francaise Hoechst: *See—*
Blanc, Alain, 4,595,751, Cl. 544-105.000.
Pierre, Gerard; Kordi, Mokhlis E.; and Cauquis, Georges, 4,595,467, Cl. 204-79.000.
Societe Lorraine de Laminage Continu-Sollac (Societe Anonyme): *See—*
Mangin, Michel; and Bardet, Patrick, 4,595,045, Cl. 164-472.000.
Societe Nationale d'Etude et de Construction de Meteurs d'Aviation S.N.E.C.M.A.: *See—*
Naudet, Jacky, 4,595,339, Cl. 416-95.000.
Societe Nationale Elf Aquitaine: *See—*
Coste, Camille; Crozat, Georges; and Mauran, Sylvain, 4,595,774, Cl. 556-118.000.
Tellier, Jacques; and Gautier, Jean-Claude, 4,595,512, Cl. 252-8.55C.
Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux: *See—*
Betirac, Michel, 4,595,999, Cl. 365-154.000.
Soderstrom, Ronald L.: *See—*
Baasch, Holger J.; Goodman, Douglas S.; Luecke, Francis S.; Soderstrom, Ronald L.; and Spiller, Eberhard A., 4,595,261, Cl. 350-394.000.
Soeda, Naohiko: *See—*
Sato, Kuniaki; Nakajima, Yasuhisa; Soeda, Naohiko; Ohta, Norio; and Nagashima, Atsushi, 4,595,357, Cl. 432-8.000.
Soeters, Raymond A., Jr.: *See—*
Preston, David M.; and Soeters, Raymond A., Jr., 4,595,349, Cl. 418-206.000.
Sogo, Toshiyuki: *See—*
Abuyama, Yasuo; and Sogo, Toshiyuki, 4,595,189, Cl. 271-9.000.
Sohio Commercial Development Co.: *See—*
Basol, Bulent M., 4,595,790, Cl. 136-256.000.
Solartech Energy and Research Corporation: *See—*
Grose, David L., 4,595,336, Cl. 416-82.000.
Solco Basel AG: *See—*
Mardi, Shalva; Lichti, Heinz F.; Baumgartner, Guido; Garteiz, Daniel; Judd, Claude I.; and Weiner, Murray, 4,595,591, Cl. 424-127.000.
Solmat Systems, Ltd.: *See—*
Dor, Inka, 4,595,505, Cl. 210-602.000.
Soloway, Norman P. Protection device for electronic components in vehicles. 4,595,842, Cl. 307-10.00R.
Solvay & Cie: *See—*
Detournay, Jean-Paul; and Cabaraux, Emile, 4,595,477, Cl. 204-253.000.
Sonobe, Hiraku, to Canon Kabushiki Kaisha. Variable magnification copying apparatus. 4,595,275, Cl. 355-8.000.
Sony Corporation: *See—*
Uedaira, Satoru; Suzuki, Masayuki; Yamanoi, Hiroshi; and Tamura, Hidemasa, 4,595,580, Cl. 423-593.000.
Sooch, Navdeep S.: *See—*
Hein, Jerrell P.; and Sooch, Navdeep S., 4,595,874, Cl. 323-312.000.

Sorimachi, Haruo; Satoh, Kiyoshi; and Suzuki, Takumi, to Fujitsu Limited. Thermal printing head with an anti-abrasion layer and method of fabricating the same. 4,595,823, Cl. 219-216.000.

Sorioka, Michitoshi, to Bridgestone Tire Company Limited. Tire building apparatus. 4,595,448, Cl. 156-396.000.

Sorlien, Mark D.: *See*—
Ball, James H.; and Sorlien, Mark D., 4,594,755, Cl. 24-545.000.

Sosebee, B. Lamar: *See*—
Walker, Paul; Hamrick, Glen F.; and Sosebee, B. Lamar, 4,595,436, Cl. 156-79.000.

Source Kramer Corporation: *See*—
Kramer, Gideon A., 4,595,266, Cl. 353-94.000.

Sournies, Francois: *See*—
Labarre, Jean-Francois; Guerch, Guy; Levy, Gaston; and Sournies, Francois, 4,595,682, Cl. 514-83.000.

Southard, Albert A. Sharpening of chain saws. 4,594,919, Cl. 76-36.000.

Southerland, Stephen R.: *See*—
Huffman, Charles E.; and Southerland, Stephen R., 4,595,907, Cl. 340-347.0DD.

Spainhour, Carroll D.: *See*—
Frazee, Ralph E., Jr.; Nis, John R.; Sanchez, Joseph; Spainhour, Carroll D.; and Stawicki, Robert P., 4,594,763, Cl. 29-407.000.

Spanjer, Keith G., to Motorola, Inc. Method for encapsulating and marking electronic devices. 4,595,647, Cl. 430-138.000.

Sparks, Roger C. Centrifugal brake for exercise machine. 4,595,198, Cl. 272-132.000.

Spector, Donald; and Miller, Robert H. Cartridge-type aroma percolator. 4,595,564, Cl. 422-125.000.

Speranza, Donald: *See*—
Daubenspeck, Ronald E.; Smyth, Robert R.; and Speranza, Donald, 4,595,986, Cl. 364-424.100.

Sperry Corporation: *See*—
D'Almeida, Werner K.; and Boeck, Oldemar, 4,594,840, Cl. 56-11.200.
Dettmer, Jay R., 4,595,918, Cl. 340-739.000.
Kregness, Glen R.; Dekarske, Clarence W.; and Criswell, Peter B., 4,595,911, Cl. 340-347.0DD.
McMahon, Donald H., 4,595,830, Cl. 250-227.000.
Morley, Kenneth S.; Wiedenman, Gregory B.; and White, James K., 4,595,996, Cl. 364-900.000.

Spicer, Victor R., to Planhorse International (NZ) Limited. Clamp for holding sheet articles. 4,594,754, Cl. 24-536.000.

Spies, Alfons, to Dr. Johannes Heidenhain GmbH. Position measuring method and apparatus. 4,595,991, Cl. 364-525.000.

Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. Rat hypothalamic GRF. 4,595,676, Cl. 514-12.000.

Spiller, Eberhard A.: *See*—
Baasch, Holger J.; Goodman, Douglas S.; Luecke, Francis S.; Soderstrom, Ronald L.; and Spiller, Eberhard A., 4,595,261, Cl. 350-394.000.

Staar S.A.: *See*—
d'Alayer de Costemore d'Arc, Stephane M., 4,595,962, Cl. 360-94.000.

Stabilimento Industriale Singer, s.r.l.: *See*—
Valori, Giuseppe; and Primati, Marco, 4,594,959, Cl. 112-460.000.

Stabilus GmbH: *See*—
Freitag, Herbert; and Reichert, Gerhard, 4,595,182, Cl. 267-120.000.

Stafford, Lawrence R.: *See*—
Dodge, Cleveland E., Jr.; and Stafford, Lawrence R., 4,595,174, Cl. 254-391.000.

Stanbel Group, The: *See*—
Bross, Elly, 4,595,246, Cl. 312-330.00R.

Standard Manufacturing Company, Inc.: *See*—
Oswald, Norman D.; Franklin, Carl M.; Gutzler, Marc H.; and Mankey, Harry S., 4,595,069, Cl. 180-24.020.

Standard Oil Company, The: *See*—
Basol, Bulent M.; Tseng, Eric S.; and Biter, William J., 4,595,791, Cl. 136-256.000.

Standard Oil Company (Indiana): *See*—
Bradshaw, Gale T., 4,595,878, Cl. 324-300.000.

Stanford, Charles W.: *See*—
DiMarco, Bernard; and Stanford, Charles W., 4,595,896, Cl. 335-202.000.

Stangl, Horst, to BBC Brown, Boveri & Co., Limited. Radio transmission method for a mobile radio system. 4,596,042, Cl. 455-56.000.

Stangl, Horst: *See*—
Fafflok, Friedrich; and Stangl, Horst, 4,595,113, Cl. 220-23.830.

Stangl & Vogt GmbH & Co. KG, Firma: *See*—
Fafflok, Friedrich; and Stangl, Horst, 4,595,113, Cl. 220-23.830.

Stanke, James A.: *See*—
Nelmark, Jack D.; and Stanke, James A., 4,595,066, Cl. 175-85.000.

Stanley, Louis, to Card-O-Matic Pty. Limited. Winding and insulation insert device. 4,594,775, Cl. 29-736.000.

Stanton, Michael; Gates, Allen P.; and Potts, Rodney M., to Vickers Limited. Radiation-sensitive plates formed using diazonium salts. 4,595,648, Cl. 430-162.000.

Stapleford, Gary N.: *See*—
Wang, An; Stapleford, Gary N.; and Neiss, Richard W., 4,595,921, Cl. 340-825.080.

Stas, Georges; and Biver, Christian, to Interox (Societe Anonyme). Treatment of gases containing organic sulphur compounds. 4,595,577, Cl. 423-245.000.

Stauffer Chemical Co.: *See*—
Buren, Lawrence L.; and Baker, Don R., 4,595,411, Cl. 71-118.000.
Lee, Chang R.; Lin, Chifa F.; and Melachouris, Nicholas, 4,595,594, Cl. 426-35.000.
Leone-Bay, Andrea; Weil, Edward D.; and Tomko, John, 4,595,400, Cl. 71-92.000.
Teach, Eugene G., 4,595,408, Cl. 71-94.000.

Stawicki, Robert P.: *See*—
Frazee, Ralph E., Jr.; Nis, John R.; Sanchez, Joseph; Spainhour, Carroll D.; and Stawicki, Robert P., 4,594,763, Cl. 29-407.000.

Steckelberg, Willi R.: *See*—
Kelly, Michael G.; and Steckelberg, Willi R., 4,595,628, Cl. 428-265.000.

Steed, Philip V., to Phillips Petroleum Company. Sample conditioning. 4,595,397, Cl. 55-37.000.

Steger, John J.: *See*—
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,595,668, Cl. 502-66.000.
Tauster, Samuel J.; Montagna, Angelo A.; Steger, John J.; Fung, Shun C.; and Cross, Virginia R., 4,595,670, Cl. 502-74.000.

Steiner, Alois, to Sulzer-Ruti Machinery Work, Ltd. Weaving machine. 4,595,089, Cl. 139-11.000.

Steiner, Hermann; Schonherr, Walter; and Helbig, Peter, to Patent-Treuhand-Gesellschaft. Halogen incandescent lamp and socket combination, particularly for direct assembly into a fixture with bayonet lock. 4,595,859, Cl. 313-579.000.

Steinman, Barry, to Safety Trim Industries, Inc. Fluorescent textile material. 4,595,627, Cl. 428-241.000.

Stepan Company: *See*—
Wood, Robert J., 4,595,711, Cl. 521-158.000.

Stephansen, Erik. Air bearing support apparatus for drying a moving web. 4,594,795, Cl. 34-68.000.

Steppat, Manfred: *See*—
Wolters, Norbert; Steppat, Manfred; and Bertling, Alfred, 4,594,842, Cl. 56-94.000.

Sterling Drug Inc.: *See*—
Lesher, George Y.; and Singh, Baldev, 4,595,762, Cl. 546-288.000.

Sterling, John D., Jr.: *See*—
Bartlett, Philip L.; Daly, John J., Jr.; and Sterling, John D., Jr., 4,595,522, Cl. 252-305.000.

Sterner, Maurice E., Jr., to Schlegel Corporation. Window vent. 4,594,813, Cl. 49-450.000.

Steuler-Industriewerke GmbH: *See*—
Rohringer, Ernst, 4,595,435, Cl. 156-73.100.

Stevenson, Robert: *See*—
Biftu, Tesfaye; Doebber, Thomas W.; Hwang, San-Bao; Beattie, Thomas R.; Shen, Tsung-Ying; and Stevenson, Robert, 4,595,693, Cl. 514-461.000.

Stiefelmeyer, Gunther; and Langbein, Konrad, to Leuze Electronic GmbH & Co. Method of generating current pulses for operating a light-emitting diode and circuit arrangement for carrying out the method. 4,595,864, Cl. 315-246.000.

Stiga AB: *See*—
Andersson, Roger; Engdahl, Lennart; and Klasson, Jan, 4,594,843, Cl. 56-295.000.

Stihl, Andreas: *See*—
Schliemann, Harald; Wissmann, Michael; and Nickel, Hans, 4,594,780, Cl. 30-382.000.

Sting, Donald W. Multiple internal reflection cell optical system for use in infrared spectrophotometry of liquid and fluidized samples. 4,595,833, Cl. 250-353.000.

Stinson, William F.: *See*—
Chan, Yuen H.; Jones, Frank D.; and Stinson, William F., 4,596,002, Cl. 365-189.000.

Stitzer, Steven N.; and Goldie, Harry, deceased (by Goldie, Fritzi, legal representative), to United States of America, Air Force. Frequency selective signal-to-noise enhancer/limiter apparatus. 4,595,889, Cl. 333-17.00L.

Stivers, David A.; and Guenthner, Richard A., to Minnesota Mining and Manufacturing Company. Processing elastomers. 4,595,720, Cl. 524-100.000.

Stockton, William W.: *See*—
Snow, Barton H.; and Stockton, William W., 4,594,852, Cl. 60-38.281.

Stoner, Donald L., to Microperipheral Corporation, The. FSK data communication system. 4,596,022, Cl. 375-45.000.

Stoody, William R. Self-contained fluid pump aerosol dispenser. 4,595,127, Cl. 222-135.000.

Storage Technology Corporation: *See*—
Bailey, Roger G., 4,595,959, Cl. 360-67.000.

Stotlar, Suzanne C.: *See*—
LaDelfe, Peter C.; and Stotlar, Suzanne C., 4,595,832, Cl. 250-338.000.

Stout, Mike F.: *See*—
Brown, Roy N.; Stout, Mike F.; Hagen, Arnulf P.; and Garwin, Leo, 4,595,599, Cl. 427-5.000.

Straub, Ferdinand; Aydin, Oral; Linke, Wolfgang; Schroeder, Gerd; and Fickeisen, Peter, to BASF Aktiengesellschaft. Water-soluble terpolymers and their preparation. 4,595,737, Cl. 526-264.000.

Strauss, Paul: *See*—
Rowe, William A.; and Strauss, Paul, 4,595,857, Cl. 313-407.000.

Strike, Donald P.: *See*—
Schiehser, Guy A.; Nielsen, Susan T.; and Strike, Donald P., 4,595,757, Cl. 546-197.000.

Stroman, David W.: *See*—
Brodasky, Thomas F.; and Stroman, David W., 4,595,770, Cl. 549-541.000.

Strong, David G.: *See—*
Hall, Richard L.; Jenniches, Frieda S.; Kehoe, James R.; Strong, David G.; and Silcott, Edward N., 4,595,816, Cl. 219-121.0LD.

Studt, William L.: *See—*
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Dodson, Stuart A., 4,595,683, Cl. 514-222.000.

Stuhmer, Werner: *See—*
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,595,531, Cl. 260-239.0BD.

Such, Christopher H., to Dulux Australia Ltd. Thermoplastic coating compositions. 4,595,722, Cl. 514-296.000.

Suda, Shigeyuki; Niwa, Yukichi; Ogino, Yasuo; and Ohwada, Mitsutoshi, to Canon Kabushiki Kaisha. In-focus state detection device. 4,595,271, Cl. 354-403.000.

Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Hydraulic control system for lock-up clutch. 4,595,088, Cl. 192-0.076.

Sugimori, Seiji: *See—*
Matsuoka, Toshio; Kurozu, Shinichi; Koyabu, Yukio; Nagayasu, Tadamitu; and Sugimori, Seiji, 4,595,574, Cl. 423-107.000.

Sugishita, Susumu: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,595,347, Cl. 418-173.000.

Sugita, Nobuyuki; Kudo, Kiyoshi; and Nagaoka, Koichi. Process for the preparation of benzene polycarboxylic acids. 4,595,470, Cl. 204-157.870.

Sulzer-Ruti Machinery Work, Ltd.: *See—*
Steiner, Alois, 4,595,089, Cl. 139-11.000.

Sumitomo Chemical Company, Ltd.: *See—*
Haga, Toru; Nagano, Eiki; Yoshida, Ryo; and Hashimoto, Shunichi, 4,595,409, Cl. 71-96.000.

Sumitomo Electric Industries, Ltd.: *See—*
Kuhara, Yoshiki; Tada, Koji; Tatsumi, Masami; and Hamazaki, Yuuji, 4,595,876, Cl. 324-96.000.
Miyazawa, Shintaro; and Murai, Shigeo, 4,595,423, Cl. 148-1.500.

Sumitomo Gomu Kogyo Kabushiki Kaisha: *See—*
Matsumura, Takahiro; and Inui, Yoshiharu, 4,595,162, Cl. 248-68.100.

Sumitomo Heavy Industries, Ltd.: *See—*
Matsuoka, Toshio; Kurozu, Shinichi; Koyabu, Yukio; Nagayasu, Tadamitu; and Sugimori, Seiji, 4,595,574, Cl. 423-107.000.

Sumitomo Metal Mining Company Limited: *See—*
Ogasa, Tadayoshi; and Kondo, Fumio, 4,595,572, Cl. 423-25.000.

Sun-Diamond Growers of California: *See—*
Gunnerson, Robert E.; and Jue, Gary, 4,595,595, Cl. 426-438.000.

Sundet, Sherman A., to Du Pont de Nemours, E. I., and Company. Reverse osmosis membrane, casting solution, and processes for making same. 4,595,708, Cl. 521-63.000.

Sundstrand Corporation: *See—*
Glennon, Timothy F., 4,595,965, Cl. 361-20.000.
Parro, Robert C., II, 4,595,976, Cl. 363-41.000.

Sunset Ltd.: *See—*
Guibert, Raul, 4,595,008, Cl. 128-399.000.

Sunvic Regler GmbH: *See—*
Roth, Gunther, 4,595,029, Cl. 137-82.000.

Sutehall, Donald: *See—*
Ford, Graham; and Sutehall, Donald, 4,595,433, Cl. 156-64.000.

Suzuki, Daiji: *See—*
Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, 4,594,868, Cl. 72-12.000.

Suzuki, Masayuki: *See—*
Uedaira, Satoru; Suzuki, Masayuki; Yamanoi, Hiroshi; and Tamura, Hidemasa, 4,595,580, Cl. 423-593.000.

Suzuki, Takumi: *See—*
Sorimachi, Haruo; Satoh, Kiyoshi; and Suzuki, Takumi, 4,595,823, Cl. 219-216.000.

Suzuki, Yoshiji: *See—*
Kinoshita, Katsuyuki; and Suzuki, Yoshiji, 4,595,375, Cl. 445-14.000.

Suzuki, Yujiro: *See—*
Shimizu, Etsuo; Aoki, Yuji; Suzuki, Yujiro; and Miura, Norio, 4,595,639, Cl. 428-690.000.

Sweet, Roger H.; and Mayer, Edward, to Mattel, Inc. Toy action figure. 4,595,378, Cl. 446-99.000.

Swenson, Richard C., to United States of America, Navy. Method for detecting faults in a synthetic electro-mechanical cable. 4,595,792, Cl. 174-102.0SC.

SWF Auto-Electric GmbH: *See—*
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.

Swinbanks, Malcolm A., to National Research Development Corp. Attenuation of sound waves. 4,596,033, Cl. 381-71.000.

Swiss Aluminium Ltd.: *See—*
Attinger, Urs; and Lutschg, Serge, 4,595,302, Cl. 384-558.000.
Pawlek, Rudolf; and Meier, Hans-Anton, 4,595,475, Cl. 204-243.00R.

Swope, Thomas A. Portable roll stock dispenser. 4,595,154, Cl. 242-55.530.

Syntex (U.S.A.) Inc.: *See—*
Clark, Robin; and Povzhitkov, Moysey M., 4,595,690, Cl. 514-356.000.

Syprocode, Inc.: *See—*
Inouye, Tohru; and Tong, Lai-Chun J., 4,595,549, Cl. 264-267.000.

Tada, Koji: *See—*
Kuhara, Yoshiki; Tada, Koji; Tatsumi, Masami; and Hamazaki, Yuuji, 4,595,876, Cl. 324-96.000.

Tahvonen, Risto, to Kemira Oy. Fungistatic method. 4,595,589, Cl. 424-93.000.

Taisei Kogyo Co., Ltd.: *See—*
Iino, Takashi, 4,595,046, Cl. 165-39.000.

Tajima, Tomoyuki, to Koken Ltd.; and Nagasu, Youichiro. Process for preparing an inhibiting agent against proliferation of animals malignant tumor cells. 4,595,657, Cl. 435-41.000.

Takada, Mitsuru: *See—*
Ito, Hiroshi; Hiramatsu, Shigeki; and Takada, Mitsuru, 4,594,916, Cl. 74-866.000.

Takahama, Akio: *See—*
Ohki, Hiroshi; Fujii, Kenji; Ogawa, Hidehiro; and Takahama, Akio, 4,595,294, Cl. 356-375.000.

Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; and Ueda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus for internal combustion engine. 4,594,982, Cl. 123-425.000.

Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; Ueda, Atsushi; and Sasaki, Takeo, to Mitsubishi Jidosha Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Engine operating parameter control apparatus. 4,594,983, Cl. 123-425.000.

Takahashi, Hideaki; Kondo, Haruyoshi; Saji, Keiichi; Hayakawa, Kiyoharu; and Takeuchi, Takashi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Limiting electric current type oxygen sensor. 4,595,485, Cl. 204-406.000.

Takahashi, Kazuo, to Canon Kabushiki Kaisha. Recording apparatus. 4,595,282, Cl. 355-53.000.

Takahashi, Naoki; Higuchi, Osamu; Miyakawa, Seii; Uno, Masahito; and Sato, Hiroshi, to Hitachi, Ltd. Pick and place unit. 4,595,335, Cl. 414-744.00R.

Takahashi, Yoshinobu: *See—*
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,595,570, Cl. 422-186.050.

Takase, Kahei; Yasunami, Masafumi; Tomiyama, Tsuyoshi; Tomiyama, Akira; and Yanagisawa, Takashi, to Kotobuki Seiyaku Co. Ltd. Azulene derivatives, processes of their synthesis and their uses as anti-ulcerative and anti-inflammatory agents. 4,595,694, Cl. 514-492.000.

Takase, Shinji; Inoue, Akira; Omata, Tatuo; Mori, Masao; Yamazaki, Yoshihiro; and Kubo, Tatsuki, to Nippon Oil Co., Ltd. Catalyst for the hydrotreating of heavy hydrocarbon oils. 4,595,667, Cl. 502-63.000.

Takayama, Hiroshi; and Maruyama, Hiroshi, to Kyocera Corporation. High alumina sintered body. 4,595,665, Cl. 501-128.000.

Takayasu, Toyoaki: *See—*
Kimura, Kazuo; Sakai, Kunihide; Inoue, Chikara; Hayashi, Hiroyuki; Takayasu, Toyoaki; Ayabe, Yasuhiro; and Miyake, Kayoko, 4,595,964, Cl. 360-125.000.

Takeda Chemical Industries, Ltd.: *See—*
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,595,678, Cl. 514-53.000.
Kamatani, Yoshio; and Sakamoto, Takurou, 4,595,741, Cl. 528-53.000.
Nishimura, Susumu; and Nomura, Hiroaki, 4,595,530, Cl. 260-239.00B.

Takeguchi, Shunsuke: *See—*
Umeha, Genkichi; Urano, Shigeru; Hirakawa, Osamu; and Takeguchi, Shunsuke, 4,595,556, Cl. 419-8.000.

Takenaga, Hiroshi: *See—*
Tashiro, Korefumi; Saito, Kunio; Takenaga, Hiroshi; and Yasunami, Masahiro, 4,596,013, Cl. 370-86.000.

Takeno, Tadayoshi; Ishii, Koichi; Yamane, Koichi; Kita, Kazuo; Iwasaki, Toshio; and Hirase, Koichi, to Kao Corporation; and Kawasaki Steel Corporation. Metal cleaning compositions. 4,595,519, Cl. 252-146.000.

Takeomi Murakami: *See—*
Murakami, Takeomi; and Ishikawa, Nobuo, 4,595,417, Cl. 106-309.000.

Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, to Dai Nippon Insatsu Kabushiki Kaisha. System and plate bending machine for registering in an offset printing press. 4,594,868, Cl. 72-12.000.

Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, to Nissin Kogyo Kabushiki Kaisha. Assembly of vacuum booster and master cylinder. 4,594,854, Cl. 60-547.100.

Takeuchi, Hirosi: *See—*
Nagatsuma, Kazuyuki; Ito, Yukio; Takeuchi, Hirosi; Ashida, Sakichi; and Jyomura, Shigeru, 4,595,853, Cl. 310-313.00D.

Takeuchi, Takashi: *See—*
Takahashi, Hideaki; Kondo, Haruyoshi; Saji, Keiichi; Hayakawa, Kiyoharu; and Takeuchi, Takashi, 4,595,485, Cl. 204-406.000.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,595,698, Cl. 514-565.000.

Takeuchi, Yasuhiro: *See—*
Nishino, Atsushi; Kimura, Kunio; Takeuchi, Yasuhiro; and Ishihara, Koji, 4,595,664, Cl. 501-124.000.

Takiar, Hem P.; and Belani, Jagdish, to National Semiconductor Corporation. System for electroplating molded semiconductor devices. 4,595,480, Cl. 204-297.00W.

Takiguchi, Kiyoaki, to Computer Services Corporation. Sorting device. 4,595,104, Cl. 209-548.000.

Tamaru, Shigemi; and Yamamoto, Kiyomi, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter with detachable optional accessories. 4,595,812, Cl. 200-307.000.

Tamura, Hidemasa: *See*—
Uedaira, Satoru; Suzuki, Masayuki; Yamanoi, Hiroshi; and Tamura, Hidemasa, 4,595,580, Cl. 423-593.000.

Tamura, Mitsuhisa: *See*—
Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, 4,595,701, Cl. 518-701.000.

Tanabe, Seiichi: *See*—
Nakanishi, Kenichi; Tanabe, Seiichi; and Izumi, Jun, 4,595,642, Cl. 429-19.000.

Tanaka, Hiroo: *See*—
Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, 4,595,701, Cl. 518-701.000.

Tanaka, Shunpei: *See*—
Uehara, Masao; and Tanaka, Shunpei, 4,595,946, Cl. 358-29.000.

Tangorra, Giorgio; and Robecchi, Edoardo, to Industrie Pirelli S.p.A. Antivibration device particularly adapted for an automotive engine support. 4,595,167, Cl. 248-638.000.

Tangorra, Giorgio, to Industrie Pirelli S.p.A. Driving belt. 4,595,388, Cl. 474-204.000.

Tanzawa, Misao; Saito, Kinzi; and Fukushima, Ichiro, to Ricoh Company, Ltd. Blade cleaning device. 4,595,280, Cl. 355-15.000.

Tape, Inc.: *See*—
Newkirk, Raymond K.; and Dickmeyer, Ronald J., 4,595,446, Cl. 156-356.000.

Tashiro, Korefumi; Saito, Kunio; Takenaga, Hiroshi; and Yasunami, Masahiro, to Hitachi, Ltd. Data transmission network. 4,596,013, Cl. 370-86.000.

Tatekura, Koichi; Mochizuki, Kiyofumi; and Ejiri, Yoshihiro, to Kokusai Denshin Denwa Co., Ltd. Method and apparatus for measuring distribution of elongation in an optical cable. 4,595,284, Cl. 356-73.100.

Tateyama, Masamitsu: *See*—
Nakai, Yoshio; and Tateyama, Masamitsu, 4,595,728, Cl. 525-81.000.

Tatsumi, Masami: *See*—
Kuhara, Yoshiki; Tada, Koji; Tatsumi, Masami; and Hamazaki, Yuuji, 4,595,876, Cl. 324-96.000.

Tatsuno, Kyoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Particle diameter measuring device. 4,595,291, Cl. 356-336.000.

Tauster, Samuel J.; Montagna, Angelo A.; Steger, John J.; Fung, Shun C.; and Cross, Virginia R., to Exxon Research and Engineering Co. Zeolite catalyst. 4,595,670, Cl. 502-74.000.

Tauster, Samuel J.: *See*—
Fung, Shun C.; and Tauster, Samuel J., 4,595,669, Cl. 502-74.000.

Tavss, Edward A.; and Temin, Samuel C., to Colgate-Palmolive Company. Laminated polyester containing substrate and collapsible dispensing container made therefrom. 4,595,612, Cl. 428-35.000.

Tavss, Edward A.; and Temin, Samuel C., to Colgate-Palmolive Company. Laminated fluoropolymer containing substrate and collapsible dispensing container. 4,595,613, Cl. 428-35.000.

Taylor, Carl A., to Rochester Gauges, Inc. Slip bezel for adjustable gauge. 4,595,301, Cl. 374-207.000.

Taylor, Curtis P., to Plaskolite, Inc. Building construction system including a profile extrusion used as a universal structural member and assembly clips therefor. 4,594,828, Cl. 52-282.000.

Taylor, Mark O. Automatic indoor lamp unit. 4,595,860, Cl. 315-158.000.

TCH Thermo-Consulting-Heidelberg GmbH: *See*—
Mucic, Vinko, 4,594,857, Cl. 62-141.000.

TDK Electronics Co., Ltd.: *See*—
Yahagi, Tadao, 4,595,901, Cl. 336-192.000.

Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Robra, Jorg; and Goschin, Hans, 4,595,796, Cl. 179-18.0FA.

Teach, Eugene G., to Stauffer Chemical Co. N-m-phenyl succinimide and glutarimide derivatives and their use as herbicides. 4,595,408, Cl. 71-94.000.

Technicare Corporation: *See*—
Lent, Arnold H.; Hinshaw, Waldo S.; and Compton, Russell A., 4,595,879, Cl. 324-309.000.

Teetz, Volker: *See*—
Geiger, Rolf; Teetz, Volker; Scholkens, Bernward; and Wissmann, Hans, 4,595,675, Cl. 514-10.000.

Telefunken Fernseh und Rundfunk GmbH: *See*—
von der Ohe, Wilfried, 4,595,977, Cl. 363-56.000.

Telenkov, Alexandr I.: *See*—
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.

Tellier, Jacques; and Gautier, Jean-Claude, to Societe Nationale Elf Aquitaine. Process for the preparation of microemulsions between an acid phase and a hyrdophobic phase. 4,595,512, Cl. 252-8.55C.

Telmos, Inc.: *See*—
Weir, Basil, 4,595,847, Cl. 307-574.000.

Temin, Samuel C.: *See*—
Tavss, Edward A.; and Temin, Samuel C., 4,595,612, Cl. 428-35.000.
Tavss, Edward A.; and Temin, Samuel C., 4,595,613, Cl. 428-35.000.

Tenhagen, Rudolf J., to BP Chemicals Limited. Equipment for mixing liquid reactants. 4,595,565, Cl. 422-133.000.

Terada, Atsusuke; Naruto, Shunji; and Iizuka, Yoshio, to Sankyo Company Limited. Immune system regulation using novel phenylalkanoic acid derivative. 4,595,699, Cl. 514-570.000.

Teramachi, Hiroshi. Recirculating-ball linear bearing. 4,595,244, Cl. 384-15.000.

Tertinek, Christian T. Mechanism for maintaining constant belt tension on sheaves with a non-fixed center distance. 4,595,384, Cl. 474-112.000.

Terumo Corporation: *See*—
Shimizu, Atsushi; and Ichikawa, Toshiji, 4,595,021, Cl. 128-760.000.

Terumo Kabushiki Kaisha: *See*—
Fujii, Tadashi, 4,594,895, Cl. 73-599.000.

Tetra Pak International AB: *See*—
Carlsson, Lars, 4,595,116, Cl. 220-359.000.

Tetra-Tech, Inc.: *See*—
Braun, Steven W.; and Hodara, Henri, 4,595,839, Cl. 250-551.000.

Teulon, Jean-Marie: *See*—
Bru-Magniez, Nicole; Teulon, Jean-Marie; and Deghenghi, Romano, 4,595,686, Cl. 514-236.000.

Teva Pharmaceutical Industries Ltd.: *See*—
Ladkani, David; Yellin, Haim; and Weiner, Ben Z., 4,595,695, Cl. 514-512.000.

Texaco Inc.: *See*—
Ang, Peter G. P.; Sammells, Anthony F.; and Morduchowitz, Abraham, 4,595,465, Cl. 204-59.00R.
Pratt, Roy E.; Lionetti, Thomas A.; and MacLean, John P., 4,595,145, Cl. 239-558.000.

Thawani, Prakash T., to Nelson Industries Inc. Plug-type muffler section. 4,595,073, Cl. 181-265.000.

Theodoulou, Sotos M.: *See*—
Maczuszenko, Andrzej; Theodoulou, Sotos M.; Hurley, Kenneth L.; and Landheer, Dolf, 4,595,277, Cl. 355-14.00D.

Thiokol Corporation: *See*—
Bell, Frank H., 4,594,933, Cl. 89-14.300.

Thioux, Alain: *See*—
Meynier, Guy; and Thioux, Alain, 4,594,937, Cl. 91-369.00R.

Tholander, Lars H. G., to Aktiebolaget Iro. Method and device for controlling a plurality of relay nozzles in a jet weaving machine. 4,595,039, Cl. 139-435.000.

Thomas, Hermann; and Herd, Josef, to Maschinenfabrik Goebel GmbH. Knife cylinder for working weblike material. 4,594,928, Cl. 83-698.000.

Thomas, Palmer D.: *See*—
Arroyo, Candido J.; and Thomas, Palmer D., 4,595,793, Cl. 174-121.00A.

Thomas, Telfer L.: *See*—
Davidson, Thomas A.; and Thomas, Telfer L., 4,595,759, Cl. 546-234.000.

Thompson, Michael: *See*—
Allen, Stephen D.; and Thompson, Michael, 4,595,656, Cl. 435-7.000.

Thompson, Ralph B., to PPG Industries, Inc. Method for producing N-organocarbamates and N,N-bis(organo)carbamates. 4,595,533, Cl. 260-239.30R.

Thompson, Roger A.; McCullough, Davey L.; Dugan, Larry M.; and Branch, Lewis R., to Adolph Coors Company. Automated railcar loader and method. 4,595,331, Cl. 414-347.000.

Thompson, Steven R.; and Harbour, William D., Jr., to Baker Drilling Equipment Company. Remote mud pump control apparatus. 4,595,343, Cl. 417-53.000.

Thomson Components-Mostek Corporation: *See*—
Cohen, Judith S.; Browning, Joel W.; and Gopffarth, Wilford H., 4,595,498, Cl. 210-192.000.

Thomson-CSF: *See*—
Gabbay, Emile, 4,596,028, Cl. 378-41.000.
Grall, Georges; and Peynaud, Francois, 4,596,007, Cl. 367-92.000.

Thomson-CSF Telephone: *See*—
Gilles, Bernard; Roux, Raphael; and Paulet, Jose , 4,595,797, Cl. 179-84.00A.

Thomson, David J., to AT&T Bell Laboratories. Data detector using probabalistic information in received signals. 4,596,024, Cl. 375-100.000.

Thorausch, Klaus: *See*—
Jeromin, Lutz; Johannisbauer, Wilhelm; Thorausch, Klaus; Skrapac, Franjo; Hartmann, Helmut; Hentschel, Karl; and Michel, Otto, 4,595,461, Cl. 203-72.000.

Thornton, Michael G.; and Clark, Benton C., III, to Martin Marietta Corporation. Liquid sample holder. 4,595,561, Cl. 422-58.000.

Thrall Car Manufacturing Company: *See*—
Smith, Kenneth H.; and Marulic, Walter J., 4,594,948, Cl. 105-359.000.

Tihanyi, Jeno : *See*—
Huber, Anton; and Tihanyi, Jeno , 4,595,966, Cl. 361-93.000.

Tiitola, Antti-Jussi, to Karhu-Titan Oy. Coating material and coating for a ski, for variable snow conditions, and method of manufacture of same. 4,595,215, Cl. 280-604.000.

Timesavers, Inc.: *See*—
Mickelson, Maurice G.; and Mutzberg, Herman J., 4,594,815, Cl. 51-138.000.

Ting, Vincent W.: *See*—
Woo, James T. K.; Ting, Vincent W.; and Marcinko, Richard M., 4,595,716, Cl. 523-403.000.

Tinnel, Nelson E. Automated temporary roof support system for mining equipment. 4,595,316, Cl. 405-291.000.

Tkachenko, Alexandr V., deceased: *See—*
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.

Tkachenko, Elena V., administrator: *See—*
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.

Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, 4,595,735, Cl. 526-125.000.

Tobar, Inc.: *See—*
Miller, Edward J., Jr., 4,595,884, Cl. 330-258.000.

Toganoh, Shigeo; and Arai, Ryuichi, to Canon Kabushiki Kaisha. Recording method. 4,595,931, Cl. 346-1.100.

Toho Gas Co. Ltd.: *See—*
Sago, Yoshiharu; Kurosawa, Masaji; and Kanamori, Nobutaka, 4,595,403, Cl. 55-389.000.

Tokico Ltd.: *See—*
Yoshida, Takeomi; and Yamashita, Kazuhisa, 4,595,122, Cl. 222-14.000.

Tokoro, Toranosuke, to Dainichi Sangyo K. K. Hydroponic plant cultivation device. 4,594,811, Cl. 47-65.000.

Tokyo Juki Industrial Co. Ltd: *See—*
Ide, Hiroshi, 4,594,958, Cl. 112-320.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Abuyama, Yasuo; and Sogo, Toshiyuki, 4,595,189, Cl. 271-9.000.
Endo, Yukio; Harada, Nozomu; and Yoshida, Okio, 4,595,954, Cl. 358-213.000.
Kobayashi, Hiroshi; Hirose, Tsuguhiro; and Haruyama, Hideaki, 4,596,011, Cl. 370-85.000.
Nakamura, Kunihiko, 4,595,193, Cl. 271-187.000.
Oida, Susumu, 4,594,863, Cl. 68-133.000.
Orii, Shoichi, 4,595,555, Cl. 376-283.000.
Tatsuno, Kyoichi, 4,595,291, Cl. 356-336.000.
Watanabe, Junji; and Ogura, Masahiko, 4,595,273, Cl. 355-3.00R.
Yamaguchi, Yoshihiro; and Ohashi, Hiromichi, 4,595,939, Cl. 357-38.000.

Tokyo Yogyo Kabushiki Kaisha: *See—*
Kato, Hitoshi; and Kawamoto, Eiji, 4,595,178, Cl. 266-280.000.

Tom McGuane Industries, Inc.: *See—*
Detweiler, Charles A., 4,594,980, Cl. 123-376.000.

Tomiyama, Akira: *See—*
Takase, Kahei; Yasunami, Masafumi; Tomiyama, Tsuyoshi; Tomiyama, Akira; and Yanagisawa, Takashi, 4,595,694, Cl. 514-492.000.

Tomiyama, Tsuyoshi: *See—*
Takase, Kahei; Yasunami, Masafumi; Tomiyama, Tsuyoshi; Tomiyama, Akira; and Yanagisawa, Takashi, 4,595,694, Cl. 514-492.000.

Tomko, John: *See—*
Leone-Bay, Andrea; Weil, Edward D.; and Tomko, John, 4,595,400, Cl. 71-92.000.

Tompkins, Martin J., Jr.; and Ash, Eugene G. Method for building or repairing rotary injection fuel pump piston cylinders. 4,594,988, Cl. 123-502.000.

Tong, Lai-Chun J.: *See—*
Inouye, Tohru; and Tong, Lai-Chun J., 4,595,549, Cl. 264-267.000.

Top Off Corp.: *See—*
Russell, Barry A.; and Fettes, Ian J., 4,595,230, Cl. 296-102.000.

Torgow, Abraham. Game apparatus utilizing a ball controlled electrical switch. 4,595,202, Cl. 273-122.00A.

Torrence, Robert J., to Controls Company of America. Inline solenoid operated valve. 4,595,171, Cl. 251-129.070.

Townsend, David E.: *See—*
Greene, Tammie B.; Townsend, David E.; and Perfetti, Thomas A., 4,595,024, Cl. 131-77.000.

Toyo Boseki Kabushiki Kaisha T/A Toyobo Co., Ltd.: *See—*
Kuze, Katsuaki; Matsuyama, Yujiro; Maeda, Kozo; Ota, Takeshi; Kobayashi, Masahiro; Hongo, Tsuyoshi; and Makimura, Osamu, 4,595,715, Cl. 523-181.000.

Toyo Seikan Kaisha, Limited: *See—*
Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,595,326, Cl. 413-1.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Akashi, Teruo; Ito, Hiroshi; and Yamada, Shigemichi, 4,594,908, Cl. 74-359.000.
Azuma, Hitoshi; and Niimi, Masatoshi, 4,595,118, Cl. 220-374.000.
Dohnomoto, Tadashi; and Kubo, Masahiro, 4,595,638, Cl. 428-614.000.
Fujimura, Kazushiro; and Mizuno, Kazuyoshi, 4,594,985, Cl. 123-489.000.
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,595,570, Cl. 422-186.050.
Ito, Hiroshi; Hiramatsu, Shigeki; and Takada, Mitsuru, 4,594,916, Cl. 74-866.000.
Kubo, Seitoku; Morisawa, Kunio; and Miura, Masakatsu, 4,594,914, Cl. 74-730.000.
Morisawa, Kunio; and Kondo, Tadashi, 4,595,087, Cl. 192-67.00R.
Nakamura, Norihiko; and Ohnaka, Hidemi, 4,594,992, Cl. 123-559.000.
Okawa, Susumu; Jufuku, Yasunobu; and Okuwaki, Shigeru, 4,595,386, Cl. 474-201.000.
Shigenobu, Hiromichi, 4,594,975, Cl. 123-179.00H.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ishikawa, Masakazu, 4,594,912, Cl. 74-607.000.

Trares, Bernard F.; and Nichols, Robinson F., to B. F. Goodrich Company, The. Method of making a pneumatic deicer by vacuum pressing utilizing a curable rubber-cross-linked rubber composition. 4,595,442, Cl. 156-286.000.

Trenkle, Robert W.: *See—*
Mookherjee, Braja D.; and Trenkle, Robert W., 4,595,525, Cl. 252-522.00R.

Trevisan, Dante: *See—*
Gandini, Marco; and Trevisan, Dante, 4,595,940, Cl. 357-42.000.

Tri City Laboratory Specialists, Inc.: *See—*
Zeigler, Warren L.; and Ziegler, Roy F., 4,594,742, Cl. 4-607.000.

Trickes, Georg: *See—*
Petrzilka, Martin; and Trickes, Georg, 4,595,521, Cl. 252-299.610.

Troyer, A. Forrest, to DeKalb Pfizer Genetics. Inbred corn line. 4,594,810, Cl. 47-58.000.

Trube, Hans: *See—*
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.

Trumbore, David C.; and Kays, William A., to Owens-Corning Fiberglas Corporation. Pollution-reducing method of incorporating dust suppressant in fibrous insulation material. 4,595,443, Cl. 156-296.000.

TRW Inc.: *See—*
Kalamasz, Thomas G., 4,595,473, Cl. 204-181.100.

Tsai, Kun K., to Li Mao Sports Co., Inc. Skateboard. 4,595,209, Cl. 280-11.115.

Tschesche, Harald; Wenzel, Herbert; Schmuck, Rainer; and Schnabel, Eugen, to Bayer Aktiengesellschaft. Homologues of aprotinin with, in place of lysine, other aminoacids in position 15, process for their preparation and their use as medicaments. 4,595,674, Cl. 514-9.000.

Tseng, Eric S.: *See—*
Basol, Bulent M.; Tseng, Eric S.; and Biter, William J., 4,595,791, Cl. 136-256.000.

Tseronakis, Antoine. Sink trap assembly. 4,594,740, Cl. 4-288.000.

Tsuboi, Takayuki, to Canon Kabushiki Kaisha. Camera having lens protection cover. 4,595,268, Cl. 354-149.110.

Tsubuko, Kazuo; and Hashimoto, Junichiro, to Ricoh Company, Ltd. Liquid developer for electrophotography. 4,595,646, Cl. 430-115.000.

Tsuchie, Kimihiro. Auxiliary wheel arrangement of bicycle. 4,595,213, Cl. 280-293.000.

Tsui, Cyrus: *See—*
Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,595,875, Cl. 324-73.0PC.

Tsuruoka, Yoshihisa: *See—*
Morimoto, Kiyoshi; Watanabe, Hiroshi; Tsuruoka, Yoshihisa; and Shimizu, Yukihiko, 4,595,862, Cl. 315-169.400.

Tung, Ker-Kong: *See—*
Cragle, Linda K.; Harris, Paul C.; Lee, Shih-Yun; Tung, Ker-Kong; and Vodian, Morton A., 4,595,661, Cl. 436-534.000.

Tung, Lu H.: *See—*
McCreedy, Kathleen M.; Kramer, Edward J.; and Tung, Lu H., 4,595,707, Cl. 521-62.000.

Tyrell, John A.; and Freimiller, Gary L., to General Electric Company. Aromatic polycarbonate containing thieno-2-one-5,5-dioxide terminal groups. 4,595,733, Cl. 525-462.000.

UBE Industries, Ltd.: *See—*
Nakano, Tsunetomo; Yasuno, Hiroshi; and Nishio, Kazuaki, 4,595,745, Cl. 528-125.000.

Uchiyama, Tadamitsu; Hayashi, Toshihiro; and Osamura, Yoshinori, to Minolta Camera Kabushiki Kaisha. Paper feed device having retractable separating pawls. 4,595,191, Cl. 271-170.000.

Ueda, Atsushi: *See—*
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; and Ueda, Atsushi, 4,594,982, Cl. 123-425.000.
Takahashi, Akira; Danno, Yoshiaki; Iwata, Toshio; Ueda, Atsushi; and Sasaki, Takeo, 4,594,983, Cl. 123-425.000.

Uedaira, Satoru; Suzuki, Masayuki; Yamanoi, Hiroshi; and Tamura, Hidemasa, to Sony Corporation. Method for manufacturing fine powder of barium zirconate. 4,595,580, Cl. 423-593.000.

Uehara, Masao; and Tanaka, Shunpei, to Olympus Optical Company Ltd. White balance control system including a fluorescent light ripple detector. 4,595,946, Cl. 358-29.000.

Ueno, Hiroshi: *See—*
Nomura, Takeshi; Maruyama, Kouji; Ueno, Hiroshi; and Inaba, Naomi, 4,595,735, Cl. 526-125.000.

Ueno, Masato: *See—*
Kusano, Takae; and Ueno, Masato, 4,595,364, Cl. 433-185.000.

Uhle, Heiko, to Messerschmitt-Bolkow-Blohm GmbH. Control system particularly for wingless guided ammunition. 4,595,157, Cl. 244-3.220.

Uken, William D.: *See—*
Dubrow, Robert S.; Dittmer, Catherine A.; and Uken, William D., 4,595,635, Cl. 428-447.000.

Umeha, Genkichi; Urano, Shigeru; Hirakawa, Osamu; and Takeguchi, Shunsuke, to Nippon Piston Ring Co., Ltd. Method for manufacturing camshaft. 4,595,556, Cl. 419-8.000.

Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Physiologically active substance, arphamenine and production thereof. 4,595,698, Cl. 514-565.000.

Underwood, Thomas L. Deep well pipe water release valve. 4,595,061, Cl. 166-373.000.
Uniden Corporation: *See*—
Endo, Hiroshi, 4,595,795, Cl. 179-2.0EA.
UniDynamics Corporation: *See*—
Ficken, Leonard A.; Podgorny, Gerald J.; and Boyle, James A., 4,594,838, Cl. 53-471.000.
Union Carbide Corporation: *See*—
D'Silva, Themistocles D. J., 4,595,769, Cl. 549-470.000.
Gray, Robert L., Jr.; and Oetinger, Peter L., 4,595,490, Cl. 208-310.00R.
Harding, Ronald H., 4,595,425, Cl. 148-18.000.
Union Oil Company of California: *See*—
Harbolt, Bruce; and Saake, James T., 4,595,350, Cl. 425-7.000.
Holstedt, Richard A.; and Croudace, Michael C., 4,595,514, Cl. 252-46.400.
Union Special Corporation: *See*—
Zorn, Robert; and Dispennett, David, 4,594,876, Cl. 72-414.000.
Union Special GmbH: *See*—
Von Hagen, Wolf R., 4,594,957, Cl. 112-304.000.
United Kingdom Atomic Energy Authority: *See*—
Barker, Allan; and Collins, Nigel W., 4,594,774, Cl. 29-723.000.
Done, Kenneth C. W., 4,595,177, Cl. 266-248.000.
United States of America
Agriculture: *See*—
Vargas, Roger I.; Mabry, Harold E.; Myers, Arthur L.; and Kobayashi, Richard M., 4,594,964, Cl. 119-1.000.
Air Force: *See*—
Antonuzzi, Anthony P.; and Carignan, Donald J., 4,595,808, Cl. 200-37.00R.
Bridenbaugh, John C.; and Love, Robert W., 4,595,156, Cl. 244-1.00R.
Frederick, Robert, 4,595,298, Cl. 374-144.000.
Harvey, Robert A.; and Morris, Robert W., Jr., 4,595,824, Cl. 219-302.000.
Kushnick, Steven B.; and Eichhorn, Gunther, 4,594,851, Cl. 60-261.000.
Stitzer, Steven N.; and Goldie, Harry, deceased, 4,595,889, Cl. 333-17.00L.
Army: *See*—
Edlin, George R., 4,595,287, Cl. 356-28.500.
Ishmael, John, 4,594,921, Cl. 81-9.400.
Kobus, Joseph P.; and Ringer, Kenneth A., 4,595,926, Cl. 343-368.000.
Rongus, Leo P.; Overman, David L.; and Johnson, Robert N., 4,594,944, Cl. 102-221.000.
Shoemaker, Charles J.; Scavnicky, John A.; Little, Malcolm E.; Hagy, Emily M.; and Bloom, Aaron, 4,595,003, Cl. 128-201.190.
Energy: *See*—
Carlson, Larry W., 4,594,793, Cl. 34-10.000.
Fenstermacher, Charles A.; and Boyer, Keith, 4,596,017, Cl. 372-74.000.
Greenhalgh, Wilbur O., 4,595,528, Cl. 252-629.000.
LaDelfe, Peter C.; and Stotlar, Suzanne C., 4,595,832, Cl. 250-338.000.
Neace, James C., 4,595,529, Cl. 252-631.000.
Norgren, Richard M.; Gray, Joe W.; and Hirschfeld, Tomas B., 4,596,036, Cl. 382-6.000.
Snyder, Fred L.; and Blank, Merle L., 4,595,681, Cl. 514-77.000.
Wright, James T., 4,595,803, Cl. 179-170.600.
National Aeronautics and Space Administration: *See*—
Collins, Vernon G.; and Cofer, Wesley R., III, 4,595,399, Cl. 55-255.000.
St. Clair, Anne K.; and St. Clair, Terry L., 4,595,548, Cl. 264-236.000.
Vykukal, Hubert C., 4,594,734, Cl. 2-2.10A.
Navy: *See*—
Hansen, James P., 4,595,925, Cl. 343-13.00R.
Jarrett, Bobby R., 4,595,909, Cl. 340-347.0AD.
Lee, Woodrow W., 4,595,463, Cl. 204-2.100.
Swenson, Richard C., 4,595,792, Cl. 174-102.0SC.
U.S. Philips Corporation: *See*—
Beris, Petrus J. M.; Wondergem, Jan J.; and Vledder, Hendrik J., 4,594,961, Cl. 118-212.000.
Cardoso, Jean-Francois; Fink, Mathias; and Hottier, Francois, 4,594,896, Cl. 73-599.000.
Clarke, John A., 4,595,263, Cl. 350-432.000.
Dona, Marinus J. J.; Franken, Adrianus J. J.; Haes, Freddy; and Reynhout, Cornelis M., 4,594,778, Cl. 30-43.900.
Lohstroh, Jan, 4,595,942, Cl. 357-44.000.
United Technologies Corporation: *See*—
Cronauer, Edward A., 4,595,891, Cl. 333-127.000.
Eaton, Harry E.; and Novak, Richard C., 4,595,637, Cl. 428-608.000.
Glomb, Walter L., Jr., 4,595,856, Cl. 310-339.000.
Kenison, David F.; and Sheppard, Donald E., 4,594,849, Cl. 60-39.290.
Legge, John R.; and Nunley, Charles E., 4,595,444, Cl. 156-285.000.
Moffatt, E. Marston, 4,594,894, Cl. 73-515.000.
Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., 4,595,987, Cl. 364-431.020.
University of Delaware: *See*—
Ostroff, Gary R.; and Pene, Jacques J., 4,595,660, Cl. 435-172.300.
University of Minnesota, Regents of the: *See*—
Wellinghoff, Stephen T.; and Lin, Ching, 4,595,609, Cl. 427-377.000.
University of Notre Dame du Lac: *See*—
Miller, Marvin J., 4,595,532, Cl. 260-239.00A.
University Patents, Inc.: *See*—
Barrett, Harrison H.; Barber, Herbert B.; and Wild, Walter J., 4,595,014, Cl. 128-654.000.
Uno, Masahito: *See*—
Takahashi, Naoki; Higuchi, Osamu; Miyakawa, Seii; Uno, Masahito; and Sato, Hiroshi, 4,595,335, Cl. 414-744.00R.
UOP Inc.: *See*—
Chang, Y. Alice; Kulkarni, Sudhir S.; and Funk, Edward W., 4,595,507, Cl. 210-638.000.
Hedrick, Brian W., 4,595,567, Cl. 422-146.000.
Imai, Tamotsu; and Abrevaya, Hayim, 4,595,673, Cl. 502-227.000.
Upjohn Company, The: *See*—
Brodasky, Thomas F.; and Stroman, David W., 4,595,770, Cl. 549-541.000.
Urano, Shigeru: *See*—
Umeha, Genkichi; Urano, Shigeru; Hirakawa, Osamu; and Takeguchi, Shunsuke, 4,595,556, Cl. 419-8.000.
Urma AG: *See*—
Berner, Willy; Berger, Hans; and Boller, Kurt, 4,595,320, Cl. 408-182.000.
Uskokovic, Milan R.: *See*—
Baggiolini, Enrico G.; Batcho, Andrew D.; Boris, Alfred; and Uskokovic, Milan R., 4,595,776, Cl. 556-436.000.
USM Corporation: *See*—
Allen, Christopher M.; and Hinchlieff, Ian R., 4,595,718, Cl. 523-434.000.
USV Pharmaceutical Corp.: *See*—
Loev, Bernard; and Chan, Wan-Kit, 4,595,696, Cl. 514-513.000.
Utility Trailer Manufacturing Company: *See*—
Bennett, Paul F.; Warwick, James M.; and Caird, George J., 4,595,231, Cl. 296-181.000.
Vale, Wylie W., Jr.: *See*—
Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,595,676, Cl. 514-12.000.
Valenti, James P.; and Zirkel, Eric C., to Armstrong World Industries, Inc. Simulated embossing on floor covering. 4,595,621, Cl. 428-159.000.
Valentini, Domenico: *See*—
Pecci, Giancarlo; Carvani, Luigi; Valentini, Domenico; and Zaninelli, Michele, 4,595,488, Cl. 208-412.000.
Valeo: *See*—
Cadars, Patrick; and LeFevre, Daniel, 4,595,051, Cl. 165-122.000.
Valori, Giuseppe; and Primati, Marco, to Stabilimento Industriale Singer, s.r.l. Locking device for removable sewing-machine control cams. 4,594,959, Cl. 112-460.000.
van Abeelen, Petrus C. A. M.: *See*—
Sederel, Willem L.; and van Abeelen, Petrus C. A. M., 4,595,633, Cl. 428-412.000.
Van Dalen, Leonard. Plug cutter. 4,595,321, Cl. 408-205.000.
Van Damme, Henri; Fripiat, Jose J.; Nijs, Hubert; Marceau, Philippe; and Francois, Obrecht, to Centre National de la Recherche Scientifique (CNRS). Photosensitive cell for the decomposition of water. 4,595,568, Cl. 422-186.000.
van der Heem, Peter: *See*—
Cohen, Howard J.; van der Heem, Peter; and Fitch, Steven J., 4,595,578, Cl. 423-338.000.
Van Dine, Gilbert A.: *See*—
Beckner, Mark W.; Davis, James A.; Gausmann, Eric J.; Hiller, Thomas L.; Olson, Philip D.; and Van Dine, Gilbert A., 4,596,010, Cl. 370-60.000.
Vangaever, Frank; and Vanhumbeeck, Jacky, to Siemens Aktiengesellschaft. Method for determining current efficiency in galvanic baths. 4,595,462, Cl. 204-1.00T.
Vanhumbeeck, Jacky: *See*—
Vangaever, Frank; and Vanhumbeeck, Jacky, 4,595,462, Cl. 204-1.00T.
Vannier, Daniel, to Schlumberger Technology Corporation. Centering apparatus. 4,595,055, Cl. 166-241.000.
van Os, Cornelis J., to Noord-Nederlandsche Machinefabriek b.v. Method for controlling the gap present between the wall of a cylinder barrel and a ball piston and apparatus embodying the method. 4,594,939, Cl. 92-169.000.
van Woudenberg, Jan F.: *See*—
Gloss, Erwin; Jeenicke, Edmund; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; van Woudenberg, Jan F.; and Zucker, Udo, 4,594,981, Cl. 123-424.000.
Varco International, Inc.: *See*—
Boyadjieff, George I.; and Campbell, Andrew B., 4,595,062, Cl. 166-379.000.
Varga, John M. J. Gas compressor or blower. 4,595,345, Cl. 417-500.000.
Vargas, Roger I.; Mabry, Harold E.; Myers, Arthur L.; and Kobayashi, Richard M., to United States of America, Agriculture. Method and apparatus for the mass rearing of fruit flies. 4,594,964, Cl. 119-1.000.
Varian Associates, Inc.: *See*—
Mintz, Donald M., 4,595,482, Cl. 204-298.000.
Varitronic Systems, Inc.: *See*—
McGourty, Thomas K.; and McGourty, Lawrence F., 4,595,305, Cl. 400-208.000.
Varo, Inc.: *See*—
Rambauske, Werner, 4,595,288, Cl. 356-124.000.

Vartoukian, Artin G.; and Haggerty, Robert P., to Singer Company, The. Method and apparatus for sewing mitered corners of box type articles. 4,594,956, Cl. 112-262.100.

Vates, Heinz: *See—*
Hufnagel, Walter; and Vates, Heinz, 4,595,738, Cl. 526-348.100.

Vectrix Corporation: *See—*
McCallister, William O.; and Katz, Richard M., 4,595,917, Cl. 340-703.000.

Veeder Industries Inc.: *See—*
Asmundsson, Einar, 4,594,892, Cl. 73-304.00C.
Bononi, Fred A.; and Weis, Armand J., deceased, 4,594,874, Cl. 72-356.000.

VEGA Grieshaber GmbH & Co.: *See—*
Benz, Karl; and Huber, Gerhard, 4,594,891, Cl. 73-290.00V.

Veit GmbH & Co.: *See—*
Herrmann, Eggert, 4,594,800, Cl. 38-77.830.
Kunze, Walter; and Hess, Alfred, 4,595,106, Cl. 211-118.000.

Veltman, Preston L.: *See—*
Andreasen, Jens; Donnelly, James R.; Felsvang, Karsten S.; Jons, Ebbe S.; and Veltman, Preston L., 4,595,576, Cl. 423-242.000.

Venture Tape Corp.: *See—*
Cohen, Lewis S., 4,595,615, Cl. 428-36.000.

Venturello, Carlo; D'Aloisio, Rino; and Ricci, Marco, to Montedison S.p.A. Peroxide compositions based on tungsten and phosphorus or arsenic, and processes and uses relative thereto. 4,595,671, Cl. 502-159.000.

Verber, Carl M.; and Kenan, Richard P., to Battelle Memorial Institute. Optical engagement array multiplication. 4,595,994, Cl. 364-841.000.

Vere, Bernard; Mathevon, Paul; and Le Pargneux, Jacques, to Cogema et Framatome. Process and installation for welding grids for nuclear fuel assemblies. 4,595,815, Cl. 219-58.000.

Vereinigte Edelstahlwerke Aktiengesellschaft: *See—*
Windisch, Franz, 4,594,924, Cl. 83-177.000.

Verge, John P.: *See—*
Goldsworthy, John; Marshall, Winston S.; and Verge, John P., 4,595,540, Cl. 558-414.000.

Versprille, Adriaan: *See—*
Jansen, Jozef R.; and Versprille, Adriaan, 4,595,015, Cl. 128-713.000.

Vicarb S.A.: *See—*
Prudhon, Francois; and Mangin, Patrick, 4,595,579, Cl. 423-487.000.

Vickers Limited: *See—*
Stanton, Michael; Gates, Allen P.; and Potts, Rodney M., 4,595,648, Cl. 430-162.000.

Victor Company of Japan, Limited: *See—*
Kimura, Kazuo; Sakai, Kunihide; Inoue, Chikara; Hayashi, Hiroyuki; Takayasu, Toyoaki; Ayabe, Yasuhiro; and Miyake, Kayoko, 4,595,964, Cl. 360-125.000.
Matsumoto, Yukio, 4,595,631, Cl. 428-323.000.

Viesselmann, Kim P., to GEHL Company. Forage blower having replaceable wear liner. 4,595,318, Cl. 406-97.000.

Vilati Villamos Automatika Fovallalkozo es Gyarto Vallalat: *See—*
Dulk, Karoly, 4,595,877, Cl. 324-239.000.

Vincent, Martin P.; and Weyman, Roger M. Power take-off mechanisms. 4,594,906, Cl. 74-15.400.

Virag, Robert A.: *See—*
Michaels, Thomas L.; Finley, Michael J.; and Virag, Robert A., 4,595,002, Cl. 128-200.210.

Vitec Controls, Inc.: *See—*
Johnston, Charles F., 4,595,036, Cl. 137-636.400.

Vlahek, Josip: *See—*
Bullock, Lance W.; Vlahek, Josip; and Kovacs, Ferenc, 4,595,554, Cl. 264-522.000.

Vlattas, Isidoros, to Ciba-Geigy Corporation. Diazacycloalkyl-1,2,4-triazolo[2,3-c][1,3]benzodiazepines useful as neuroleptic and/or antihistaminic agents. 4,595,535, Cl. 260-243.300.

Vledder, Hendrik J.: *See—*
Beris. Petrus J. M.; Wondergem, Jan J.; and Vledder, Hendrik J., 4,594,961, Cl. 118-212.000.

Vockentanz, Rainer: *See—*
Ringel, Konrad; and Vockentanz, Rainer, 4,594,946, Cl. 102-307.000.

Vodian, Morton A.: *See—*
Cragle, Linda K.; Harris, Paul C.; Lee, Shih-Yun; Tung, Ker-Kong; and Vodian, Morton A., 4,595,661, Cl. 436-534.000.

Vogel, Friedrich; Paust, Joachim; and Nuerrenbach, Axel. Magnesium chloride or phosphonium halide derivatives of 3,7,11-trimethyldodeca-2,6(10)-diene(triene)-1-ol. 4,595,783, Cl. 568-9.000.

Vogele, Gunter: *See—*
Buchner, Norbert; Vogele, Gunter; and Wilke, Bernd, 4,595,560, Cl. 422-26.000.

von der Ohe, Wilfried, to Telefunken Fernseh und Rundfunk GmbH. Switched mode power supply. 4,595,977, Cl. 363-56.000.

Von Hagen, Wolf R., to Union Special GmbH. Sewing machine belt feed with variable pitch drive pulley. 4,594,957, Cl. 112-304.000.

Vranesh, George: *See—*
Ayler, Maynard F.; and Vranesh, George, 4,595,239, Cl. 299-2.000.

VSI Corporation: *See—*
Caugherty, William C.; and Whitehorn, Sydney H., 4,595,044, Cl. 164-337.000.

Vyas, Arvindkumar C.: *See—*
Brooks, Ralf M.; Vyas, Arvindkumar C.; and Connell, Brian P., 4,595,935, Cl. 346-76.0PH.

Vykukal, Hubert C., to United States of America, National Aeronautics and Space Administration. Shoulder and hip joint for hard space suits. 4,594,734, Cl. 2-2.10A.

W. Haking Enterprises Limited: *See—*
Wong, Wai C., 4,595,269, Cl. 354-204.000.

W. R. Grace Australia Limited: *See—*
Bullock, Lance W.; Vlahek, Josip; and Kovacs, Ferenc, 4,595,554, Cl. 264-522.000.

W. R. Grace & Co.: *See—*
Wiercinski, Robert A.; and Whicher, Stephen J., 4,595,636, Cl. 428-489.000.

WABCO Ltd.: *See—*
Mackenzie, Robert; and Digweed, Thomas, 4,595,083, Cl. 188-196.00C.

Wacker-Chemie GmbH: *See—*
Preiner, Gerhard; and Matejcek, Klaus, 4,595,471, Cl. 522-29.000.

Wada, Keisuke: *See—*
Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, 4,595,701, Cl. 518-701.000.

Wada, Masami; and Ajiro, Shuichi, to Hitachi Construction Machinery Co., Ltd. Shaft drilling rig. 4,595,065, Cl. 175-85.000.

Wada, Takahiro; Yokotani, Fumiko; Matsuo, Yoshihiro; and Yoneno, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Heat storage material. 4,595,516, Cl. 252-70.000.

Wadsworth, Harry J.: *See—*
Donald, David K.; Hann, Michael M.; Saunders, John; and Wadsworth, Harry J., 4,595,700, Cl. 514-616.000.

Wagner, James A., to LRV Corporation. Combination truck bed, liner, and securing structure. 4,595,229, Cl. 296-39.00R.

Wagner, Walter: *See—*
Bauer, Kurt; Edele, Reinhard; Egner-Walter, Bruno; Longney, John M.; Schmid, Eckhardt; Scholl, Wolfgang; Wagner, Walter; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,594,746, Cl. 15-250.210.

Wahle, Gunter; and Kasparek, Alois, to Hauni-Werke Korber & Co. KG. Apparatus for replenishing the supplies of filter rod sections in the magazines of filter tipping machines. 4,595,025, Cl. 131-94.000.

Wakino, Kikuo; Murata, Michihiro; and Imagawa, Shunjiro, to Murata Manufacturing Co., Ltd. Vibration-isolating article. 4,595,515, Cl. 252-62.000.

Walker, Paul; Hamrick, Glen F.; and Sosebee, B. Lamar, to Walker, Paul; and Hamrick, Glen F. Method for applying polyurethane backing. 4,595,436, Cl. 156-79.000.

Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Hydration of cyclohexene in presence of perfluorosulfonic acid polymer. 4,595,786, Cl. 568-835.000.

Wallimann, Hans: *See—*
Comploi, Georg; Loacker, Arthur; Huber, Kurt; Hutter, Wilhelm; and Wallimann, Hans, 4,594,952, Cl. 112-84.000.

Wallis, Bernard J. Method and apparatus for forming heat exchanger tubes. 4,595,135, Cl. 228-17.000.

Walsh, Richard D., Jr., to Dresser Industries, Inc. Low pressure high temperature safety valve. 4,595,033, Cl. 137-529.000.

Walter, John, to Continental Can Company, Inc. Sealing lip for lid on thermoformed container. 4,595,117, Cl. 220-359.000.

Wang, An; Stapleford, Gary N.; and Neiss, Richard W., to Wang Laboratories, Inc. Method of polling to ascertain service needs. 4,595,921, Cl. 340-825.080.

Wang Laboratories, Inc.: *See—*
Wang, An; Stapleford, Gary N.; and Neiss, Richard W., 4,595,921, Cl. 340-825.080.

Wang, Pen-Chung: *See—*
Renga, James M.; and Wang, Pen-Chung, 4,595,763, Cl. 546-290.000.

Ward Leonard Electric Co., Inc.: *See—*
Rizzotti, Alfred E., III, 4,596,049, Cl. 455-603.000.

Ware, Nathan C., to Lear Siegler, Inc. Vehicle suspension structure. 4,595,216, Cl. 280-661.000.

Warenghem, Michel: *See—*
Lombard, Claude; and Warenghem, Michel, 4,594,893, Cl. 73-304.00C.

Warfvinge, Kjell, to AB Kelva. Apparatus for cleaning particles from a web. 4,594,748, Cl. 15-308.000.

Warner & Swasey Company, The: *See—*
Brandstetter, Robert W., 4,594,791, Cl. 33-503.000.

Warrick, Frank G., to Sealed Power Corporation. Solenoid valve. 4,595,035, Cl. 137-625.650.

Warwick, James M.: *See—*
Bennett, Paul F.; Warwick, James M.; and Caird, George J., 4,595,231, Cl. 296-181.000.

Washington State University Research Foundation, Inc.: *See—*
Pellerin, Roy F.; Galligan, William L.; and Eberle, George F., 4,594,900, Cl. 73-806.000.

Wass, Lloyd G. Raft inflation valve. 4,595,374, Cl. 441-35.000.

Wasserman, Norman, to AT&T Bell Laboratories. Component mounting apparatus. 4,595,794, Cl. 174-138.00G.

Wasserstrom, David H.: *See—*
Wolfe, Edward I.; Wasserstrom, David H.; and Kilpert, Richard, 4,595,508, Cl. 210-631.000.

Watanabe, Eiichi: *See—*
Nakamura, Shuzo; Deguchi, Takashi; Tamura, Mitsuhisa; Ishino, Masaru; Wada, Keisuke; Watanabe, Eiichi; Hara, Yoshinori; Murayama, Kenji; and Tanaka, Hiroo, 4,595,701, Cl. 518-701.000.

Watanabe, Hiroshi; and Aoki, Eiji, to Nippon Electric Co., Ltd. Satellite broadcasting receiver including a parabolic antenna with a feed

waveguide having a microstrip down converter circuit. 4,596,047, Cl. 455-281.000.

Watanabe, Hiroshi: *See—*
Morimoto, Kiyoshi; Watanabe, Hiroshi; Tsuruoka, Yoshihisa; and Shimizu, Yukihiko, 4,595,862, Cl. 315-169.400.

Watanabe, Junji; and Ogura, Masahiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Copying apparatus and method automatically sequentially copying two different pages of a document. 4,595,273, Cl. 355-3.00R.

Watanabe, Kenji: *See—*
Hirai, Kazumi; Akiyoshi, Mitsuo; Nakano, Chikao; Watanabe, Kenji; and Kodama, Satoru, 4,595,827, Cl. 219-518.000.

Watanabe, Kiyoshi: *See—*
Azuma, Masaaki; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,595,752, Cl. 544-258.000.

Watanabe, Kohichi; and Murata, Michihiro, to Murata Manufacturing Co., Ltd. Method of producing an electrical double layer capacitor. 4,594,758, Cl. 29-25.420.

Watanabe, Yasuhiko: *See—*
Ando, Hideo; Kawaguchi, Hideo; and Watanabe, Yasuhiko, 4,594,953, Cl. 112-112.000.

Watari, Shinichiro: *See—*
Nagase, Eiichi; and Watari, Shinichiro, 4,595,789, Cl. 136-244.000.

Wataya, Seiji; Kanno, Yoshiaki; Nishimura, Yukinobu; Shimomura, Setsuhiro; and Matsumoto, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection control apparatus for internal combustion engine. 4,594,987, Cl. 123-494.000.

Water Services of America, Inc.: *See—*
Baron, Walter J.; and Cleaver, Laird C., 4,595,049, Cl. 165-95.000.
Baron, Walter J., 4,595,050, Cl. 165-95.000.

Waterman, Dale G. Vacuum cleaner with air jet assist. 4,594,749, Cl. 15-345.000.

Watkins, Bruce J.; and Rosero, Marcelo P., to Hughes Tool Company. Metal-to-metal seal casing hanger. 4,595,053, Cl. 166-209.000.

Watts, Brian R.; and Carlton, Robert E. Protective drain. 4,594,739, Cl. 4-287.000.

Wave Power Industries: *See—*
Raichlen, Fredric; and Lee, Jiin-Jen, 4,594,853, Cl. 60-502.000.

Wean United, Inc.: *See—*
Ginzburg, Vladimir B., 4,595,358, Cl. 432-65.000.

Weaver, Jimmie D., Jr.: *See—*
Byrd, Audis C.; Morris, Robert J.; Black, Robert H.; and Weaver, Jimmie D., Jr., 4,595,566, Cl. 422-134.000.

Webler, William E.; and Lieber, Clement, to American Hospital Supply Corporation. Lumen mounted electrodes for pacing and intra-cardiac ECG sensing. 4,595,012, Cl. 128-642.000.

Webster Spring Co. Inc.: *See—*
Hagemeister, Robert C., 4,595,180, Cl. 267-103.000.
Hagemeister, Robert C., 4,595,181, Cl. 267-103.000.

Weco Wehmeyer & Co. Fahrzeug-Fahrzeugteile-Werke GmbH & Co.: *See—*
Wehmeyer, Gerhard, 4,595,242, Cl. 301-6.00V.

Wege, Manfred, to Bolenz & Schafer Maschinenfabrik Zweigniederlassung der Rexnard GmbH. Pressure accumulator and vessel thereof. 4,595,038, Cl. 138-31.000.

Wehmeyer, Gerhard, to Weco Wehmeyer & Co. Fahrzeug-Fahrzeugteile-Werke GmbH & Co. Rear hub shell for bicycles and method of manufacturing same. 4,595,242, Cl. 301-6.00V.

Weigel, Leland O.: *See—*
Atkins, Randall K.; and Weigel, Leland O., 4,595,754, Cl. 546-18.000.

Weil, Edward D.: *See—*
Leone-Bay, Andrea; Weil, Edward D.; and Tomko, John, 4,595,400, Cl. 71-92.000.

Weil, Robert R.: *See—*
Williams, Robert C., III; Williams, Stephen R.; and Weil, Robert R., 4,595,420, Cl. 134-6.000.

Weinberger, Frank W.: *See—*
Arlasky, David F.; Arlasky, Ronald F.; Crites, Allan B.; Miller, Carol; Pellicano, Anthony J.; and Weinberger, Frank W., 4,595,903, Cl. 340-64.000.

Weiner, Ben Z.: *See—*
Ladkani, David; Yellin, Haim; and Weiner, Ben Z., 4,595,695, Cl. 514-512.000.

Weiner, Irving L.: *See—*
Gershman, Russell J.; Weiner, Irving L.; and Daniels, Arthur C., 4,596,035, Cl. 382-6.000.

Weiner, Murray: *See—*
Mardi, Shalva; Lichti, Heinz F.; Baumgartner, Guido; Garteiz, Daniel; Judd, Claude I.; and Weiner, Murray, 4,595,591, Cl. 424-127.000.

Weir, Basil, to Telmos, Inc. Bi-directional high voltage analog switch having source to source connected field effect transistors. 4,595,847, Cl. 307-574.000.

Weis, Armand J., deceased: *See—*
Bononi, Fred A.; and Weis, Armand J., deceased, 4,594,874, Cl. 72-356.000.

Weis, Delma G., legal representative: *See—*
Bononi, Fred A.; and Weis, Armand J., deceased, 4,594,874, Cl. 72-356.000.

Weishaupt, Walter: *See—*
Proske, Arnost; and Weishaupt, Walter, 4,595,902, Cl. 340-63.000.

Wellerson, Ralph, Jr.: *See—*
Reckel, Rudolph P.; Harris, Joanne L.; Wellerson, Ralph, Jr.; Shaw, Sally M.; and Kaplan, Paul M., 4,595,654, Cl. 435-7.000.

Wellinghoff, Stephen T.; and Lin, Ching, to University of Minnesota, Regents of the. Corrosion resistant tantalum pentaoxide coatings. 4,595,609, Cl. 427-377.000.

Wells Lamont Corporation: *See—*
Connelly, John R., 4,594,736, Cl. 2-163.000.

Welsch, John H., to InterMetro Industries Corp. Utility cart. 4,595,107, Cl. 211-187.000.

Wenzel, Herbert: *See—*
Tschesche, Harald; Wenzel, Herbert; Schmuck, Rainer; and Schnabel, Eugen, 4,595,674, Cl. 514-9.000.

Werner, Frank; Marx, Matthias; Horn, Peter; and Schmidt, Hans U., to BASF Aktiengesellschaft. Process for the preparation of optionally cellular polyurethane polyurea molded parts. 4,595,705, Cl. 521-51.000.

Werner, Uwe: *See—*
Olszewski, Egon; Schaper, Klaus-Dieter; and Werner, Uwe, 4,594,814, Cl. 51-40.000.

Wessel, Elmer A., to Industrial Machine Specialties, Inc. Ball and bat carrier. 4,595,226, Cl. 294-146.000.

Wessel, Wolf: *See—*
Engel, Gerhard; Engelbrecht, Hans C.; and Wessel, Wolf, 4,594,993, Cl. 123-571.000.

West, Danny E.: *See—*
Bohannon, William D., Jr.; Hamilton, Alfred S.; and West, Danny E., 4,595,431, Cl. 156-54.000.

Westergren, Larry L.: *See—*
Mroch, Alan B.; and Westergren, Larry L., 4,595,886, Cl. 331-1.00A.

Westinghouse Electric Corp.: *See—*
DelVecchio, Robert M.; and Krause, Robert F., 4,595,843, Cl. 307-83.000.
Hall, Richard L.; Jenniches, Frieda S.; Kehoe, James R.; Strong, David G.; and Silcott, Edward N., 4,595,816, Cl. 219-121.0LD.

Westner, Andrew A.: *See—*
Oswald, Alexis A.; Jermasen, Torris G.; Westner, Andrew A.; and Huang, I-der, 4,595,753, Cl. 546-21.000.

Weyman, Roger M.: *See—*
Vincent, Martin P.; and Weyman, Roger M., 4,594,906, Cl. 74-15.400.

Wheeler, John R., Jr., to Crompton & Knowles Corporation. Manufacture of elongated extruded cross-linked products. 4,595,546, Cl. 264-83.000.

Wheeler, Thomas E. Portable work stand to quickly receive, seal, and rotate, a cylinder head of an engine during liquid leak testing. 4,594,882, Cl. 73-49.700.

Whicher, Stephen J.: *See—*
Wiercinski, Robert A.; and Whicher, Stephen J., 4,595,636, Cl. 428-489.000.

White, Dwain M., to General Electric Company. Method for preparing copper-diamine complexes and diamines. 4,595,773, Cl. 556-110.000.

White, James K.: *See—*
Morley, Kenneth S.; Wiedenman, Gregory B.; and White, James K., 4,595,996, Cl. 364-900.000.

Whitehorn, Sydney H.: *See—*
Caugherty, William C.; and Whitehorn, Sydney H., 4,595,044, Cl. 164-337.000.

Whitmore, William Y.: *See—*
Brubaker, Mary A.; Ehrhart, Wendell A.; and Whitmore, William Y., 4,595,626, Cl. 428-220.000.

Wiatrak, Thomas R.: *See—*
Haury, Gilbert E.; Patel, Nathalal G.; Lockard, Walter G.; Wiatrak, Thomas R.; and Curran, Neal J., 4,595,212, Cl. 280-242.0WC.

Wickersheim, John C.: *See—*
Rolf, Gerald; and Wickersheim, John C., 4,594,735, Cl. 2-89.000.

Wiedenman, Gregory B.: *See—*
Morley, Kenneth S.; Wiedenman, Gregory B.; and White, James K., 4,595,996, Cl. 364-900.000.

Wiedenmann, Hans-Martin: *See—*
Raff, Lothar; and Wiedenmann, Hans-Martin, 4,594,984, Cl. 123-440.000.

Wiedmann, Siegfried K., to International Business Machines Corporation. Semiconductor memory. 4,596,000, Cl. 365-174.000.

Wiegand, Herbert; and Baumer, Klaus, to Deutsche-Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Injection device, more particularly for direct-injection diesel engines. 4,595,144, Cl. 239-533.300.

Wiegand, Karl E.: *See—*
Nalepa, Christopher J.; Ranken, Paul F.; and Wiegand, Karl E., 4,595,742, Cl. 528-64.000.

Wiercinski, Robert A.; and Whicher, Stephen J., to W. R. Grace & Co. Bitumen adhesive composition containing an ionomeric elastomer and waterproofing membranes comprising same. 4,595,636, Cl. 428-489.000.

Wilczynski, Janusz S., to International Business Machines Corporation. Alignment system for lithographic proximity printing. 4,595,295, Cl. 356-401.000.

Wild, Walter J.: *See—*
Barrett, Harrison H.; Barber, Herbert B.; and Wild, Walter J., 4,595,014, Cl. 128-654.000.

Wiley, David; and Akers, Roy A., to Bell & Howell Company. Envelope feeding system and speed control for mail sorting machines. 4,595,188, Cl. 271-4.000.

Wilharm, Madelynn T.: *See—*
LaMarre, Thomas M.; Martin, Cynthia H.; and Wilharm, Madelynn T., 4,595,691, Cl. 514-367.000.

Wilke, Bernd: *See—*
Buchner, Norbert; Vogele, Gunter; and Wilke, Bernd, 4,595,560, Cl. 422-26.000.

Wilkinson, William K., to Du Pont de Nemours, E. I., and Company. Water soluble polyamines and process for their preparation. 4,595,731, Cl. 525-329.100.

Willans, Robert D. H.: *See—*
Redhead, Harry T.; and Willans, Robert D. H., 4,595,421, Cl. 134-6.000.

Willard, James A. Billiard cue tip shaper, scuffer, trimmer and gauge. 4,594,782, Cl. 30-494.000.

Willenbring, Gerald R.: *See—*
Gruber, Carl L.; and Willenbring, Gerald R., 4,596,018, Cl. 372-87.000.

William H. Rorer, Inc.: *See—*
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Dodson, Stuart A., 4,595,683, Cl. 514-222.000.

Williams, George J. Tube bundle support. 4,595,161, Cl. 248-68.100.

Williams International Corporation: *See—*
Joy, John R., 4,594,850, Cl. 60-39.141.

Williams, Ivan P., to Oakland Design Products Limited. Cross-bows. 4,594,994, Cl. 124-25.000.

Williams, Ray D. Method of forming photopolymeric molding pattern. 4,595,543, Cl. 264-22.000.

Williams, Robert C., III; Williams, Stephen R.; and Weil, Robert R. Method and apparatus for cleaning and maintaining carpet. 4,595,420, Cl. 134-6.000.

Williams, Stephen R.: *See—*
Williams, Robert C., III; Williams, Stephen R.; and Weil, Robert R., 4,595,420, Cl. 134-6.000.

Williams, William M.: *See—*
Drew, Robin A. L.; Muir, Wilson B.; and Williams, William M., 4,595,427, Cl. 148-129.000.

Willis, Donald H., to RCA Corporation. Television receiver having character generator with burst locked pixel clock and correction for non-standard video signals. 4,595,953, Cl. 358-183.000.

Wilson, Lynn O.: *See—*
Feldman, Martin; and Wilson, Lynn O., 4,595,289, Cl. 356-237.000.

Wilt, Daniel P.: *See—*
Dautremont-Smith, William C.; and Wilt, Daniel P., 4,595,454, Cl. 156-647.000.

Wilwerding, Dennis J., to Honeywell Inc. Camera focus indicator. 4,595,272, Cl. 354-409.000.

Winbladh, Per; and Garin, Gert. Method and plant for collecting of oil floating on water. 4,595,510, Cl. 210-776.000.

Windisch, Franz, to Vereinigte Edelstahlwerke Aktiengesellschaft. Liquid jet cutting apparatus. 4,594,924, Cl. 83-177.000.

Windmuller, Rudolf: *See—*
Fazzolare, Richard D.; and Windmuller, Rudolf, 4,595,596, Cl. 426-549.000.

Wine, Charles M., to RCA Corporation. Digital-to-analog converter useful in a television receiver. 4,595,910, Cl. 340-347.0DA.

Wingard, Jefferson C. Bi-directional antenna array. 4,595,928, Cl. 343-742.000.

Winter, Joseph: *See—*
Smith, Warren F., Jr.; Shapiro, Eugene; and Winter, Joseph, 4,594,766, Cl. 29-460.000.

Winyard, Rodney W., to American Welding & Manufacturing Co. Steel door frame with thermal break. 4,594,831, Cl. 52-395.000.

Wissmann, Hans: *See—*
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Wissmann, Michael: *See—*
Schliemann, Harald; Wissmann, Michael; and Nickel, Hans, 4,594,780, Cl. 30-382.000.

Wissmuller, Jan: *See—*
Anderson, Walter F., Jr.; Sabo, Brian D.; Poulo, Louis R.; Wissmuller, Jan; and Fantuzzi, Joseph D., 4,595,958, Cl. 358-296.000.

Wistuba, Eberhard; and Lenzer, Xaver, to Karl Mengele & Sohne GmbH & Co. Forage cutter or chopper. 4,594,841, Cl. 56-13.300.

Witchell, Stanley P. Air filters. 4,595,401, Cl. 55-385.00B.

Wittman, John P., to Northern Telecom Limited. Hybrid circuit. 4,595,802, Cl. 179-170.00D.

Wittmann, Alois: *See—*
Du Pont, Preston S.; Freeman, Janet E.; Ritter, Robert E.; and Wittmann, Alois, 4,595,623, Cl. 428-195.000.

Wolbrink, David W.; and Otte, Dieter W., to Broan Mfg. Co., Inc. Fan for ventilation. 4,594,940, Cl. 98-42.100.

Wolf, Erich; Lembke, Andreas; and Deininger, Rolf, to Chimicasa GmbH. Preparation for deactivating viruses and process for producing same. 4,595,593, Cl. 424-195.100.

Wolfe, Edward I.; Wasserstrom, David H.; and Kilpert, Richard, to Exxon Research and Engineering Co. Reduction of sodium/ammonium alkalinity in industrial wastewater. 4,595,508, Cl. 210-631.000.

Wolowodiuk, Walter, to Foster Wheeler Energy Corporation. Circulating solids fluidized bed reactor and method of operating same. 4,594,967, Cl. 122-4.00D.

Wolters, Norbert; Steppat, Manfred; and Bertling, Alfred, to Maschinenfabrik Kemper GmbH. Machine for harvesting and chopping of maize or similar stalk-type harvests. 4,594,842, Cl. 56-94.000.

Wondergem, Jan J.: *See—*
Beris, Petrus J. M.; Wondergem, Jan J.; and Vledder, Hendrik J., 4,594,961, Cl. 118-212.000.

Wong, Wai C., to W. Haking Enterprises Limited. Camera double exposure prevention system. 4,595,269, Cl. 354-204.000.

Woo, James T. K.; Ting, Vincent W.; and Marcinko, Richard M., to SCM Corporation. Base for a graft polymer, novel graft polymer compositions, solvent and water-reducible coatings incorporating the novel graft polymers, and processes for making them. 4,595,716, Cl. 523-403.000.

Wood, Robert J., to Stepan Company. Aromatic polyester polyols fluorocarbon compatibilized with ethoxylate propoxylate compounds for urethane and isocyanurate foams. 4,595,711, Cl. 521-158.000.

Woodley, George M., to King Instrument Corporation. Cassette storage and feeder mechanism. 4,595,327, Cl. 414-126.000.

Woog, Philippe Guy E., to Les Produits Associes LPA SA. Variable torque motor for hygienic apparatus. 4,595,850, Cl. 310-47.000.

Worthington, Paul A.: *See—*
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,595,406, Cl. 71-076.000.

Wozniak, Robert J.: *See—*
Fertig, Glenn H.; and Wozniak, Robert J., 4,595,016, Cl. 128-719.000.

Wright, James T., to United States of America, Energy. Bidirectional amplifier. 4,595,803, Cl. 179-170.600.

Wright, Stephen; and Couch, Philip R., to International Standard Electric Corporation. Coherent optical receiver. 4,596,052, Cl. 455-619.000.

Wu, Chung P.; and Kolondra, Frank, to RCA Corporation. Method for preventing arcing in a device during ion-implantation. 4,595,837, Cl. 250-492.200.

Wu, Stephen H. W.; and Sandhu, M. Akram, to Eastman Kodak Company. Rumen-stable pellets. 4,595,584, Cl. 424-19.000.

Xerox Corporation: *See—*
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Bober, Henry T., 4,595,187, Cl. 270-37.000.
Brueggemann, Harry P., 4,595,947, Cl. 358-75.000.
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Yaguchi, Tadahiro, to Honda Giken Kogyo Kabushiki Kaisha. Full-covered portable generator. 4,595,841, Cl. 290-1.00A.

Yahagi, Tadao, to TDK Electronics Co., Ltd. Inductance device with bonded metal foil electrodes. 4,595,901, Cl. 336-192.000.

Yamada, Shigemichi: *See—*
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Yamada, Shunichi: *See—*
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Yamada, Yasuyuki; Fujibayashi, Kazuo; Sato, Yasuhisa; and Yokota, Hideo, to Canon Kabushiki Kaisha. Finder system. 4,595,270, Cl. 354-222.000.

Yamaguchi, Mikio, to Nippon Seiko Kabushiki Kaisha. Tiltable steering mechanism. 4,594,909, Cl. 74-493.000.

Yamaguchi, Yoshiharu: *See—*
Yoshida, Hiroshi; and Yamaguchi, Yoshiharu, 4,594,753, Cl. 24-433.000.

Yamaguchi, Yoshihiro; and Ohashi, Hiromichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Radiation-controllable thyristor with multiple, non-concentric amplified stages. 4,595,939, Cl. 357-38.000.

Yamamoto, Haruhisa; and Okumura, Kin-ichi, to Nippon Zeon Co. Ltd. Process for producing butadiene. 4,595,788, Cl. 585-621.000.

Yamamoto, Haruo, to Nissan Motor Co., Ltd. Parts assembling method and system. 4,594,764, Cl. 29-430.000.

Yamamoto, Kiyomi: *See—*
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Yamamoto, Masashige. Method of producing a warmth keeping vessel made of ceramics or porcelain. 4,595,437, Cl. 156-87.000.

Yamamoto, Yoshio: *See—*
Matsui, Isamu; Yamamoto, Yoshio; and Nakanishi, Kazuo, 4,595,152, Cl. 242-35.50A.

Yamamura Glass Kabushiki Kaisha: *See—*
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Yamane, Koichi: *See—*
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Yamashita, Kazuhisa: *See—*
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Yamashita, Tsukasa; Matano, Masaharu; Mori, Kazuhiko; and Ota, Norihiro, to Omron Tateisi Electronics Co. Parallel-to-serial conversion of optical data using acousto-optical diffraction. 4,595,253, Cl. 350-96.130.

Yamazaki, Shuichi, to Ricoh Company, Ltd. Spread document copying method with variable magnification capability. 4,595,286, Cl. 355-77.000.

Yamazaki, Shunpei; and Hamatani, Toshiji, to Semiconductor Energy Laboratory Co., Ltd. Method for etching a semiconductor substrate or layer. 4,595,453, Cl. 156-643.000.

Yamazaki, Yoshihiro: *See—*
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Yanagihashi, Kikuji: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,595,347, Cl. 418-173.000.
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Yanagisawa, Takashi: *See*—
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Yanagiuchi, Shigenobu: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Yoshida, Kunio; Morinaga, Hisao; Nakanishi, Tosaku; and Yanagiuchi, Shigenobu, 4,595,998, Cl. 364-900.000.
Yano, Takeshi; Hori, Shinichi; Fukui, Izumu; Sato, Eiichi; and Inui, Osamu, to NEC Corporation. Drive circuit for piezoelectric stack. 4,595,854, Cl. 310-317.000.
Yao, Keiji, to Sharp Kabushiki Kaisha. Manually reciprocative section of an electronic apparatus. 4,595,993, Cl. 364-708.000.
Yasuhara, Seishi, to Nissan Motor Company, Limited. Fuel injection rate control system for an engine. 4,594,979, Cl. 123-357.000.
Yasukawa, Kazuyoshi; and Hayashi, Yoshio, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Point measuring process for preset robot. 4,595,989, Cl. 364-513.000.
Yasunami, Masafumi: *See*—
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Yatabe, Fumio: *See*—
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Yazaki, Mitsuhiro, to Kawasaki Jukogyo Kabushiki Kaisha. Fuel tank for a water craft. 4,595,030, Cl. 137-203.000.
Yellin, Haim: *See*—
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Yip, Kin F.; and Rhodes, Frances F., to Miles Laboratories, Inc. Two component stain composition for producing a Giemsa blood stain effect. 4,595,524, Cl. 252-408.100.
Yokogawa Hokushin Electric Corporation: *See*—
Maeda, Masato; and Kawamura, Shuzo, 4,594,879, Cl. 73-27.00R.
Yokota, Hideo: *See*—
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Yoshida, Hirokazu: *See*—
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Yoshida, Hiroshi; and Yamaguchi, Yoshiharu, to Yoshida Kogyo K. K. Separable slide fastener. 4,594,753, Cl. 24-433.000.
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Yuhara, Yukitomo, 4,595,028, Cl. 132-79.00R.
Yoshida Kogyo K. K.: *See*—
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Yoshida, Kunio: *See*—
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Yoshida, Okio: *See*—
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Yoshida, Ryo: *See*—
Haga, Toru; Nagano, Eiki; Yoshida, Ryo; and Hashimoto, Shunichi, 4,595,409, Cl. 71-96.000.
Yoshida, Takeomi; and Yamashita, Kazuhisa, to Tokico Ltd. Fuel supplying system for a fuel supplying apparatus having a preset fuel supplying capability. 4,595,122, Cl. 222-14.000.
Yoshida, Yutaka, to Hitachi, Ltd. Method and apparatus for character recognition. 4,596,038, Cl. 382-11.000.
Yoshikane, Tetsuo; Kagata, Akira; and Hiura, Hiromi, to Matsushita Electric Industrial Co., Ltd. Information signal regenerating stylus and manufacturing method thereof. 4,596,009, Cl. 369-173.000.
Yoshino, Zenichi, to Sanwa Kosan Kabushiki Kaisha. Production of powdery maltose. 4,595,418, Cl. 127-30.000.
Yoshitomi, Yasunari: *See*—
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Yotam, Reuben; and Carleton, Joseph G., to Eldex Laboratories, Inc. Programmable solvent delivery system and process. 4,595,495, Cl. 210-101.000.
Young, James V.: *See*—
Muchisky, Thomas P.; and Young, James V., 4,595,196, Cl. 272-99.000.
Young, Walter H.: *See*—
Garrelfs, Peter A.; and Young, Walter H., 4,595,355, Cl. 431-265.000.
Yuhara, Yukitomo, to Yoshida Industry Co., Ltd. Vanity case. 4,595,028, Cl. 132-79.00R.
Zabasnenko, Anatoly P.: *See*—
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.
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Zahradnik, Raymond L.; Jacobson, Carl L.; and Shen, Jian-Chyun, to Occidental Oil Shale, Inc. Method for fully retorting an in situ oil shale retort. 4,595,056, Cl. 166-251.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,595,698, Cl. 514-565.000.
Zaiser, LeNoir E. Fixture for use during manufacture of wing structure. 4,595,360, Cl. 432-253.000.
Zaninelli, Michele: *See*—
Pecci, Giancarlo; Carvani, Luigi; Valentini, Domenico; and Zaninelli, Michele, 4,595,488, Cl. 208-412.000.
Zank, Jeffrey T., to Alto-Shaam, Inc. Food cabinet drawer support. 4,595,247, Cl. 312-343.000.
Zaruba, John V.; Morrison, Howard J.; and Conti, Rino, to Marvin Glass & Associates. Sandwich preparation and storage container set. 4,595,099, Cl. 206-525.000.
Zeigler, Warren L.; and Ziegler, Roy F., to Tri City Laboratory Specialists, Inc. Automatically closing modesty curtain. 4,594,742, Cl. 4-607.000.
Zenith Electronics Corporation: *See*—
Rowe, William A.; and Strauss, Paul, 4,595,857, Cl. 313-407.000.
Zeugner, Horst: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,595,531, Cl. 260-239.0BD.
Zhukov, Leonid A.: *See*—
Bobrov, Alexandr V.; Zabegalov, Valery V.; Zabasnenko, Anatoly P.; Ivchenko, Nikolai S.; Litvinov, Lev P.; Papov, Jury A.; Seregin, Alexandr F.; Zhukov, Leonid A.; Gaponenko, Olga S.; Tkachenko, Alexandr V., deceased; Tkachenko, Elena V., administrator; Telenkov, Alexandr I.; and Smychnikov, Vladimir I., 4,595,817, Cl. 219-121.0PY.
Ziegelmeyer, Lynn J. Grinding machine for grinding cutter in cutter links. 4,594,920, Cl. 76-42.000.
Ziegler, Gerhard, to Dr. Ing. h.c.F. Porsche AG. Crank assembly for an internal combustion engine. 4,594,917, Cl. 74-572.000.
Ziegler, Roy F.: *See*—
Zeigler, Warren L.; and Ziegler, Roy F., 4,594,742, Cl. 4-607.000.
Ziegler, Theodore J.; Eydelman, Alexander; Koether, Frederick G.; and Lawrance, Robert A., to Over-Lowe Company, Inc. Telescoping tower for floodlighting equipment and the like. 4,594,824, Cl. 52-118.000.
Zielke, Darrell W. Cassette packing device and method. 4,594,837, Cl. 53-468.000.
Zierenberg, Bernd; and Gupte, Arun R., to Boehringer Ingelheim KG. Divisible pharmaceutical tablet with delayed active ingredient release. 4,595,587, Cl. 424-81.000.
Zinder, Norman D.; Model, Peter; and Boeke, Jef D., to Rockefeller University, The. Method for facilitating externalization of proteins synthesized in bacteria. 4,595,658, Cl. 435-68.000.
Zirkel, Eric C.: *See*—
Valenti, James P.; and Zirkel, Eric C., 4,595,621, Cl. 428-159.000.
Zorbalas, George S.: *See*—
Hamalainen, Kaarlo J.; and Zorbalas, George S., 4,595,960, Cl. 360-77.000.
Zorn, Robert; and Dispennett, David, to Union Special Corporation. Apparatus for forming the stitch forming area of a sewing machine throat plate. 4,594,876, Cl. 72-414.000.
Zucker, Udo: *See*—
Gloss, Erwin; Jeenicke, Edmund; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; van Woudenberg, Jan F.; and Zucker, Udo, 4,594,981, Cl. 123-424.000.
Zwicke, Philip E.; Rosenbush, David M.; and Couch, Robert P., to United Technologies Corporation. Contiguous event discrimination in electrostatic engine diagnostics. 4,595,987, Cl. 364-431.020.
21st Century Envelope Co., Inc.: *See*—
Kristel, Ira B., 4,595,138, Cl. 229-73.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JUNE, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Hospital Supply Corp.: *See*—
Bentley, Donald J., Re. 32,186, Cl. 210-646.000.

Angelini, Peter: *See*—
Ring, Michael; and Angelini, Peter, Re. 32,182, Cl. 162-55.000.

Barda, Jean F.; Brusq, Roger; Marti, Bernard; and Poignet, Alain, to Etablissement Public de Diffusion dit "Telediffusion de France" . System for digitally transmitting and displaying texts on television screen. Re. 32,187, Cl. 340-706.000.

Bentley, Donald J., to American Hospital Supply Corp. Fluid transfer apparatus and method of fluid transfer. Re. 32,186, Cl. 210-646.000.

Brusq, Roger: *See*—
Barda, Jean F.; Brusq, Roger; Marti, Bernard; and Poignet, Alain, Re. 32,187, Cl. 340-706.000.

Copley, George A., to Donaldson Company, Inc. Self-cleaning pulsed air cleaner. Re. 32,185, Cl. 55-96.000.

Donaldson Company, Inc.: *See*—
Copley, George A., Re. 32,185, Cl. 55-96.000.

Doyel, John S. Sewing box. Re. 32,184, Cl. 223-107.000.

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Yurchenco, James R.: *See*—
Manock, Jerrold C.; Oyama, Terrell A.; and Yurchenco, James R., 284,284, Cl. D14-114.000.

Yvetot, Roger, to Societe Generale de Fonderie. Toilet. 284,303, 6-17-86, Cl. D23-65.000.

Zambelli, Michael P.: *See*—
Mack, Henry J., Jr.; McGarvey, John N.; Paas, Terrance J.; Prince, Terry B.; and Zambelli, Michael P., 284,280, Cl. D14-2.000.

Zinter-Chahin, Christine M., to Quaker Oats Company, The. Caddy for toy hand stamps and crayons. 284,235, 6-17-86, Cl. D3-74.000.

Zughaib, Helen, to Syracuse China Corporation. Decal for use on china dinnerware or similar articles. 284,250, 6-17-86, Cl. D7-39.000.

Zusman, Bertram. Two story pedestal duplex. 284,307, 6-17-86, Cl. D25-17.000.

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Saville, F. Harmon, 5,749, Cl. 10.000.

Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Rose plant. 5,749, 6-17-86, Cl. 10.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 17, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2.1 A 4,594,734
89 4,594,735
163 4,594,736
424 4,594,737

CLASS 4

199 4,594,738
287 4,594,739
288 4,594,740
506 Re.32,181
558 4,594,741
607 4,594,742

CLASS 5

111 4,594,743

CLASS 6

4 R 4,594,744

CLASS 8

139 4,595,394

CLASS 15

92 4,594,745
250.21 4,594,746
301 4,594,747
308 4,594,748
345 4,594,749

CLASS 16

229 4,594,750

CLASS 17

1 G 4,594,751

CLASS 24

132 R 4,594,752
433 4,594,753
536 4,594,754
545 4,594,755

CLASS 28

100 4,594,756

CLASS 29

25.42 4,594,758
33 K 4,594,757
81 D 4,594,759
156.4 WL 4,594,760
156.8 R 4,594,761
281.4 4,594,762
407 4,594,763
430 4,594,764
450 4,594,765
460 4,594,766
525 4,594,767
564 4,594,768
578 4,594,769
588 4,594,770
596 4,594,771
603 4,594,772
622 4,594,773
723 4,594,774
736 4,594,775
749 4,594,776

CLASS 30

42 4,594,777
43.9 4,594,778
360 4,594,779
382 4,594,780
392 4,594,781
494 4,594,782

CLASS 33

6 4,594,783
30.5 4,594,784
172 R 4,594,785
180 AT 4,594,787
180 R 4,594,786
275 R 4,594,788
288 4,594,789
304 4,594,790
503 4,594,791
562 4,594,792

CLASS 34

10 4,594,793
57 A 4,594,794
68 4,594,795
82 4,594,796
225 4,594,797

CLASS 36

68 4,594,798
114 4,594,799

CLASS 38

77.83 4,594,800
90 4,594,801

CLASS 40

10 D 4,594,802

CLASS 42

1 T 4,594,803

CLASS 43

21.2 4,595,805
42.18 4,594,806
105 4,594,804
132.1 4,594,807
134 4,594,808

CLASS 44

51 4,595,395
63 4,595,396

CLASS 47

1.1 4,594,809
58 4,594,810
65 4,594,811

CLASS 49

404 4,594,812
450 4,594,813

CLASS 51

40 4,594,814
138 4,594,815
393 4,594,816

CLASS 52

34 4,594,817
58 4,594,818
60 4,594,819
4,594,820
72 4,594,821
90 4,594,822
4,594,823
118 4,594,824
169.4 4,594,825
221 4,594,826
230 4,594,827
282 4,594,828
285 4,594,829
334 4,594,830
395 4,594,831
715 4,594,832
806 4,594,833

CLASS 53

117 4,594,834
433 4,594,835
459 4,594,836
468 4,594,837
471 4,594,838
475 4,594,839

CLASS 55

37 4,595,397
96 Re.32,185
182 4,595,398
255 4,595,399
378 4,595,402
385 B 4,595,401
389 4,595,403

CLASS 56

11.2 4,594,840
13.3 4,594,841
94 4,594,842
295 4,594,843

CLASS 57

88 4,594,844
304 4,594,845

CLASS 59

5 4,594,846
85 4,594,847

CLASS 60

38.281 4,594,852
39.02 4,594,848
39.141 4,594,850
39.29 4,594,849
261 4,594,851
502 4,594,853
547.1 4,594,854

CLASS 62

18 4,595,404
4,595,405
92 4,594,855
112 4,594,856
141 4,594,857
175 4,594,858
235 4,594,859
271 4,594,860
304 4,594,861
417 4,594,862

CLASS 68

133 4,594,863

CLASS 70

143 4,594,864
313 4,594,865
455 4,594,866

CLASS 71

90 4,595,407
92 4,595,400
94 4,595,408
96 4,595,409
076 4,595,406
105 4,595,410
118 4,595,411

CLASS 72

7 4,594,867
12 4,594,868
21 4,594,869
24 4,594,870
164 4,594,871
4,594,872
340 4,594,873
356 4,594,874
389 4,594,875
414 4,594,876

CLASS 73

4 D 4,594,877
9 4,594,878
27 R 4,594,879
32 R 4,594,880
37.5 4,594,881
49.7 4,594,882
54 4,594,883
64.3 4,594,884
84 4,594,885
116 4,594,886
152 4,594,887
198 4,594,888
204 4,594,889
232 4,594,890
290 V 4,594,891
304 C 4,594,892
4,594,893
515 4,594,894
599 4,594,895
4,594,896
600 4,594,897
778 4,594,898
784 4,594,899
806 4,594,900
861.04 4,594,901
863.23 4,594,902
863.83 4,594,903
863.86 4,594,904
864.63 4,594,905

CLASS 74

15.4 4,594,906
105 4,594,907
359 4,594,908
493 4,594,909
572 4,594,917
594.2 4,594,910
606 R 4,594,911
607 4,594,912
665 A 4,594,918
711 4,594,913
730 4,594,914
805 4,594,915
866 4,594,916

CLASS 75

0.5 BB 4,595,412
4,595,413

CLASS 76

36 4,594,919
42 4,594,920

CLASS 81

9.4 4,594,921
99 4,594,922

CLASS 83

74 4,594,923
177 4,594,924
209 4,594,925
345 4,594,926
620 4,594,927
698 4,594,928
715 4,594,929

CLASS 84

1.02 4,594,930
1.03 4,594,931
185 4,594,932

CLASS 89

14.3 4,594,933
129.02 4,594,934
176 4,594,935

CLASS 91

51 4,594,936
369 R 4,594,937

CLASS 92

82 4,594,938
169 4,594,939

CLASS 98

42.1 4,594,940

CLASS 99

334 4,594,941

CLASS 100

137 4,594,942

CLASS 101

327 4,594,943

CLASS 102

221 4,594,944
287 4,594,945
307 4,594,946
4,594,947

CLASS 105

359 4,594,948
377 4,594,949

CLASS 106

18.16 4,595,414
100 4,595,416
264 4,595,415
309 4,595,417

CLASS 108

50 4,594,950

CLASS 111

85 4,594,951

CLASS 112

84 4,594,952
112 4,594,953
121.15 4,594,954
147 4,594,955
262.1 4,594,956
304 4,594,957
320 4,594,958
460 4,594,959

CLASS 116

34 R 4,594,960

CLASS 118

212 4,594,961
221 4,594,962
610 4,594,963

CLASS 119

1 4,594,964
3 4,594,965
130 4,594,966

CLASS 122

4 D 4,594,967

CLASS 123

1 A 4,594,968
25 E 4,594,969
73 AD 4,594,970
4,594,971
90.24 4,594,972
90.40 4,594,973
179 H 4,594,974
4,594,975
260 4,594,976
327 4,594,977
335 4,594,978
357 4,594,979
376 4,594,980
424 4,594,981
425 4,594,982
4,594,983
440 4,594,984
489 4,594,985
491 4,594,986
494 4,594,987
502 4,594,988
4,594,989
527 4,594,990
557 4,594,991
559 4,594,992
571 4,594,993

CLASS 124

25 4,594,994

CLASS 126

417 4,594,995

CLASS 127

30 4,595,418

CLASS 128

1 R 4,594,996
79 4,594,997
4,594,998
87 R 4,594,999
130 4,595,000
156 4,595,001
200.21 4,595,002
201.19 4,595,003
204.21 4,595,004
205.24 4,595,005
303 R 4,595,006
334 R 4,595,007
399 4,595,008
419 D 4,595,009
421 4,595,010
636 4,595,011
642 4,595,012
644 4,595,013
654 4,595,014
713 4,595,015
719 4,595,016
733 4,595,017
4,595,018
734 4,595,019
736 4,595,020
760 4,595,021
777 4,595,022
782 4,595,023

CLASS 131

77 4,595,024
94 4,595,025
109.1 4,595,026
280 4,595,027

CLASS 132

79 R 4,595,028

CLASS 134

1 4,595,419
6 4,595,420
4,595,421
19 4,595,422

CLASS 136

244 4,595,789
256 4,595,790
4,595,791

CLASS 137

82 4,595,029
203 4,595,030
492.5 4,595,031
527 4,595,032
529 4,595,033
625.21 4,595,034
625.65 4,595,035
636.4 4,595,036

CLASS 138

30 4,595,037
31 4,595,038

CLASS 139

11 4,595,089
435 4,595,039

CLASS 144

84 4,595,040
208 D 4,595,041

CLASS 148

1.5 4,595,423
6.15 R 4,595,424
18 4,595,425
31.55 4,595,426
129 4,595,427
187 4,595,428
403 4,595,429

CLASS 149

88 4,595,430

CLASS 152

209 B 4,595,042

CLASS 156

54 4,595,431
61 4,595,432
64 4,595,433
69 4,595,434
73.1 4,595,435
79 4,595,436
87 4,595,437
148 4,595,438
178 4,595,439
230 4,595,440
265 4,595,441
285 4,595,444
286 4,595,442
296 4,595,443
307.3 4,595,445
356 4,595,446
364 4,595,447
396 4,595,448
444 4,595,449
500 4,595,450
627 4,595,451
643 4,595,452
4,595,453
647 4,595,454

CLASS 160

36 4,595,043

CLASS 162

38 4,595,455
47 4,595,456
55 Re.32,182
123 4,595,457
158 4,595,458

CLASS 164

337 4,595,044
472 4,595,045

CLASS 165

39 4,595,046
76 4,595,047
84 4,595,048
95 4,595,049
4,595,050
122 4,595,051

CLASS 166

123 4,595,052
209 4,595,053
217 4,595,054
241 4,595,055
251 4,595,056
269 4,595,057
285 4,595,058
290 4,595,059
373 4,595,060
4,595,061
379 4,595,062
382 4,595,063

CLASS 172

178 4,595,064

CLASS 174

102 SC	4,595,792
121 A	4,595,793
138 G	4,595,794

CLASS 175

85	4,595,065
	4,595,066
331	4,595,067

CLASS 179

2 EA	4,595,795
18 FA	4,595,796
84 A	4,595,797
90 BD	4,595,798
98	4,595,799
99 R	4,595,800
115.5 PS	4,595,801
170 D	4,595,802
170.6	4,595,803

CLASS 180

9.52	4,595,068
24.02	4,595,069
125	4,595,070
132	4,595,071
169	4,595,072

CLASS 181

185	Re.32,183
265	4,595,073

CLASS 182

9	4,595,078
48	4,595,074
70	4,595,075
136	4,595,076
179	4,595,077
187	4,595,079

CLASS 184

105.3	4,595,080

CLASS 185

40 R	4,595,081

CLASS 188

71.9	4,595,085
79.5 P	4,595,082
196 C	4,595,083
328	4,595,084

CLASS 190

11	4,595,086

CLASS 192

0.076	4,595,088
67 R	4,595,087

CLASS 198

346.2	4,595,090
372	4,595,091
456	4,595,092

CLASS 200

5 A	4,595,804
6 R	4,595,805
11 TC	4,595,806
16 C	4,595,807
37 R	4,595,808
76	4,595,809
284	4,595,811
307	4,595,812

CLASS 202

177	4,595,459

CLASS 203

21	4,595,460
72	4,595,461

CLASS 204

1 T	4,595,462
2.1	4,595,463
15	4,595,464
59 R	4,595,465
67	4,595,466
79	4,595,467
98	4,595,468
	4,595,469
157.87	4,595,470
181.1	4,595,473
232	4,595,474
243 R	4,595,475
252	4,595,476
253	4,595,477
273	4,595,478
294	4,595,479
297 W	4,595,480
298	4,595,481
	4,595,482
	4,595,483
	4,595,484
406	4,595,485
412	4,595,486
433	4,595,487

CLASS 206

0.82	4,595,100
44 R	4,595,093
45.14	4,595,094
45.34	4,595,095
331	4,595,096
335	4,595,097
387	4,595,098
525	4,595,099
545	4,595,101
572	4,595,102
604	4,595,103

CLASS 208

263	4,595,489
310 R	4,595,490
326	4,595,491
412	4,595,488

CLASS 209

2	4,595,492
166	4,595,493
224	4,595,494
548	4,595,104

CLASS 210

101	4,595,495
	4,595,496
110	4,595,497
192	4,595,498
202	4,595,499
266	4,595,500
400	4,595,501
483	4,595,502
500.38	4,595,503
519	4,595,504
602	4,595,505
609	4,595,506
631	4,595,508
638	4,595,507
646	Re.32,186
665	4,595,509
776	4,595,510

CLASS 211

43	4,595,105
118	4,595,106
187	4,595,107

CLASS 212

267	4,595,108

CLASS 213

62 A	4,595,109

CLASS 215

252	4,595,110
303	4,595,111

CLASS 219

10.71	4,595,813
10.77	4,595,814
58	4,595,815
121 EB	4,595,819
121 LD	4,595,816
121 PV	4,595,818
121 PY	4,595,817
137 PS	4,595,820
216	4,595,821
	4,595,822
	4,595,823
302	4,595,824
306	4,595,825
400	4,595,826
518	4,595,827

CLASS 220

5 R	4,595,112
23.83	4,595,113
260	4,595,114
337	4,595,115
359	4,595,116
	4,595,117
374	4,595,118
450	4,595,119
469	4,595,120

CLASS 222

1	4,595,121
14	4,595,122
23	4,595,123
39	4,595,124
55	4,595,125
105	4,595,126
135	4,595,127
252	4,595,128
327	4,595,129
539	4,595,130
640	4,595,131

CLASS 223

107	Re.32,184

CLASS 225

103	4,595,132

CLASS 226

34	4,595,133

CLASS 227

9	4,595,134

CLASS 228

17	4,595,135
57	4,595,136

CLASS 229

41 R	4,595,137
73	4,595,138

CLASS 235

379	4,595,828

CLASS 236

44 R	4,595,139

CLASS 239

167	4,595,140
230	4,595,141
373	4,595,142
406	4,595,143
533.3	4,595,144
558	4,595,145
682	4,595,146

CLASS 241

55	4,595,147
92	4,595,148
101 A	4,595,149
282	4,595,150

CLASS 242

18 DD	4,595,151
35.5 A	4,595,152
55.3	4,595,153
55.53	4,595,154
848	4,595,155

CLASS 244

1 R	4,595,156
3.22	4,595,157
75 R	4,595,158
104 FP	4,595,159
199	4,595,160

CLASS 248

68.1	4,595,161
	4,595,162
229	4,595,163
429	4,595,164
539	4,595,165
559	4,595,166
638	4,595,167

CLASS 249

48	4,595,168
67	4,595,169

CLASS 250

201	4,595,810
	4,595,829
227	4,595,830
281	4,595,831
338	4,595,832
353	4,595,833
374	4,595,834
423 R	4,595,835
491.1	4,595,836
492.2	4,595,837
504 R	4,595,838
551	4,595,839
572	4,595,840

CLASS 251

129.05	4,595,170
129.07	4,595,171
321	4,595,172

CLASS 252

8.55 B	4,595,511
8.55 C	4,595,512
8.55 R	4,595,513
8.6	4,595,518
46.4	4,595,514
62	4,595,515
70	4,595,516
82	4,595,517
146	4,595,519
160	4,595,520
299.61	4,595,521
305	4,595,522
390	4,595,523
408.1	4,595,524
522 R	4,595,525
545	4,595,526
546	4,595,527
629	4,595,528
631	4,595,529

CLASS 254

342	4,595,173
391	4,595,174

CLASS 256

1	4,595,175
52	4,595,176

CLASS 260

239 A	4,595,532
	4,595,534
	4,595,539
239 B	4,595,530
239 BD	4,595,531
239.3 R	4,595,533
243.3	4,595,535
394	4,595,536
410.6	4,595,537
502.56	4,595,538
546	4,595,541

CLASS 261

53	4,595,542

CLASS 264

22	4,595,543
46.5	4,595,544
65	4,595,545
83	4,595,546
154	4,595,547
236	4,595,548
267	4,595,549
292	4,595,550
321	4,595,551
328.1	4,595,552
501	4,595,553
522	4,595,554

CLASS 266

248	4,595,177
280	4,595,178

CLASS 267

8 R	4,595,179
103	4,595,180
	4,595,181
120	4,595,182
140.1	4,595,183
156	4,595,184

CLASS 269

43	4,595,185
69	4,595,186

CLASS 270

37	4,595,187

CLASS 271

4	4,595,188
9	4,595,189
94	4,595,190
170	4,595,191
184	4,595,192
187	4,595,193

CLASS 272

73	4,595,194
97	4,595,195
99	4,595,196
127	4,595,197
132	4,595,198

CLASS 273

1.5 A	4,595,199
58 G	4,595,200
73 E	4,595,201
122 A	4,595,202
148 R	4,595,203
186 A	4,595,204
326	4,595,205

CLASS 277

25	4,595,206
53	4,595,207
206 R	4,595,208

CLASS 280

11.115	4,595,209
28	4,595,211
43.23	4,595,210
242 WC	4,595,212
293	4,595,213
296	4,595,214
604	4,595,215
661	4,595,216

CLASS 285

25	4,595,217
47	4,595,218
333	4,595,219

CLASS 290

1 A	4,595,841

CLASS 292

341.17	4,595,220

CLASS 294

16	4,595,221
	4,595,222
19.1	4,595,223
81.2	4,595,224
86.41	4,595,225
146	4,595,226

CLASS 296

24 R	4,595,227
37.7	4,595,228
39 R	4,595,229
102	4,595,230
181	4,595,231

CLASS 297

17	4,595,232
69	4,595,233
258	4,595,234
294	4,595,235
316	4,595,236
347	4,595,237
452	4,595,238

CLASS 299

2	4,595,239
24	4,595,240
93	4,595,241

CLASS 301

6 V	4,595,242

CLASS 303

6 C	4,595,243

CLASS 307

10 R	4,595,842
83	4,595,843
270	4,595,844
443	4,595,845
490	4,595,846
574	4,595,847
597	4,595,848

CLASS 310

36	4,595,849
47	4,595,850
246	4,595,851
309	4,595,852
313 D	4,595,853
317	4,595,854
332	4,595,855
339	4,595,856

CLASS 312

330 R	4,595,245
	4,595,246
343	4,595,247

CLASS 313

407	4,595,857
414	4,595,858
579	4,595,859

CLASS 315

158	4,595,860
169.3	4,595,861
169.4	4,595,862
208	4,595,863
246	4,595,864

CLASS 318

254	4,595,865
444	4,595,866
588	4,595,867
608	4,595,868
626	4,595,869
687	4,595,870
696	4,595,871

CLASS 320

13	4,595,872

CLASS 323

222	4,595,873
312	4,595,874

CLASS 324

73 PC	4,595,875
96	4,595,876
239	4,595,877
300	4,595,878
309	4,595,879
427	4,595,880

CLASS 330

54	4,595,881
151	4,595,882
255	4,595,883
258	4,595,884
303	4,595,885

CLASS 331

1 A	4,595,886
8	4,595,887

CLASS 332

18	4,595,888

CLASS 333

17 L	4,595,889
103	4,595,890
127	4,595,891
218	4,595,892
246	4,595,893

CLASS 335

18	4,595,894
26	4,595,895
202	4,595,896
205	4,595,897
216	4,595,898
	4,595,899
299	4,595,900

CLASS 336

192	4,595,901

CLASS 339

17 LC	4,595,248
17 LM	4,595,249
	4,595,250
47 R	4,595,251

CLASS 340

63	4,595,902
64	4,595,903
87	4,595,904
309.15	4,595,905
347 AD	4,595,909
347 DA	4,595,910
	4,595,912
347 DD	4,595,907
	4,595,911
347 NT	4,595,906
347 SH	4,595,908
365 C	4,595,913
515	4,595,914
572	4,595,915
604	4,595,916
703	4,595,917
706	Re.32,187
739	4,595,918
793	4,595,919
805	4,595,920
825.08	4,595,921
825.49	4,595,922
825.52	4,595,923

CLASS 343

5 PD	4,595,924
13 R	4,595,925
368	4,595,926
390	4,595,927
742	4,595,928
781 P	4,595,929
792.5	4,595,930

CLASS 346

1.1	4,595,931
33 R	4,595,932
75	4,595,933
76 PH	4,595,934
	4,595,935
139 R	4,595,936
140 R	4,595,937
	4,595,938

CLASS 347

153	4,595,299

CLASS 350

3.79	4,595,252
96.13	4,595,253
96.18	4,595,254
96.20	4,595,255
96.21	4,595,256
255	4,595,257
272	4,595,258
331 R	4,595,259
351	4,595,260
394	4,595,261
404	4,595,262
432	4,595,263
480	4,595,264
523	4,595,265

CLASS 353

94	4,595,266

CLASS 354

149.11	4,595,268
204	4,595,269
222	4,595,270
403	4,595,271
409	4,595,272
413	4,595,267

CLASS 355

3 FU	4,595,274
3 R	4,595,273
8	4,595,275
10	4,595,276
14 D	4,595,277
14 R	4,595,278
	4,595,279
15	4,595,280
51	4,595,281
53	4,595,282
73	4,595,283
75	4,595,285
77	4,595,286

CLASS 356

28.5	4,595,287

73.1 4,595,284
124 4,595,288
225 4,595,290
237 4,595,289
336 4,595,291
346 4,595,292
350 4,595,293
375 4,595,294
401 4,595,295

CLASS 357

38 4,595,939
42 4,595,940
43 4,595,941
44 4,595,942
48 4,595,943
51 4,595,944
70 4,595,945

CLASS 358

23 Re.32,188
29 4,595,946
75 4,595,947
4,595,948
111 4,595,949
122 4,595,950
147 4,595,951
4,595,952
183 4,595,953
213 4,595,954
219 4,595,955
283 4,595,956
290 4,595,957
296 4,595,958

CLASS 360

67 4,595,959
77 4,595,960
85 4,595,961
94 4,595,962
99 4,595,963
125 4,595,964

CLASS 361

20 4,595,965
93 4,595,966
152 4,595,967
4,595,968

CLASS 362

217 4,595,969
287 4,595,970
345 4,595,971

CLASS 363

15 4,595,972
18 4,595,973
21 4,595,974
33 4,595,975
41 4,595,976
56 4,595,977

CLASS 364

141 4,595,978
174 4,595,979
200 4,595,980
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401 4,595,983
405 4,595,985
424.1 4,595,986
431.02 4,595,987
466 4,595,984
483 4,595,988
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518 4,595,990
525 4,595,991
569 4,595,992
708 4,595,993
841 4,595,994
900 4,595,995
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CLASS 365

154 4,595,999
174 4,596,000
189 4,596,001
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233 4,596,004

CLASS 366

106 4,595,296

CLASS 367

38 4,596,005
87 4,596,006
92 4,596,007

CLASS 369

107 4,596,008
173 4,596,009

CLASS 370

60 4,596,010
85 4,596,011
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CLASS 371

49 4,596,014
51 4,596,015

CLASS 372

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74 4,596,017
87 4,596,018

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22 4,596,019
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29 4,595,297
144 4,595,298
170 4,595,300
207 4,595,301

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5 4,596,021
45 4,596,022
55 4,596,023
100 4,596,024
107 4,596,025
118 4,596,026

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283 4,595,555

CLASS 377

33 4,596,027

CLASS 378

41 4,596,028
105 4,596,029
119 4,596,030

CLASS 381

43 4,596,031
51 4,596,032
71 4,596,033
89 4,596,034

CLASS 382

6 4,596,035
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8 4,596,037
11 4,596,038
56 4,596,039

CLASS 383

7 4,596,040

CLASS 384

15 4,595,244
558 4,595,302

CLASS 400

82 4,595,303
157.2 4,595,304
208 4,595,305

CLASS 401

50 4,595,306
117 4,595,307
243 4,595,308

CLASS 402

80 R 4,595,309

CLASS 403

77 4,595,310
271 4,595,311

CLASS 404

11 4,595,312

CLASS 405

2 4,595,313
125 4,595,314
261 4,595,315
291 4,595,316

CLASS 406

95 4,595,317
97 4,595,318
195 4,595,319

CLASS 408

182 4,595,320
205 4,595,321
230 4,595,322

CLASS 410

36 4,595,323

CLASS 411

38 4,595,324
173 4,595,325

CLASS 413

1 4,595,326

CLASS 414

126 4,595,327
225 4,595,328
267 4,595,329
276 4,595,330
347 4,595,331
663 4,595,332
729 4,595,333
735 4,595,334
744 R 4,595,335

CLASS 416

81 4,595,338
82 4,595,336
95 4,595,339
131 4,595,337
193 A 4,595,340

CLASS 417

1 4,595,341
45 4,595,342
53 4,595,343
185 4,595,344
500 4,595,345
513 4,595,346

CLASS 418

173 4,595,347
4,595,348
206 4,595,349

CLASS 419

8 4,595,556
49 4,595,557
66 4,595,558

CLASS 420

528 4,595,559

CLASS 422

26 4,595,560
58 4,595,561
65 4,595,562
72 4,595,563
125 4,595,564
133 4,595,565
134 4,595,566
146 4,595,567
186 4,595,568
4,595,569
186.05 4,595,570
259 4,595,571

CLASS 423

25 4,595,572
76 4,595,573
107 4,595,574
210 4,595,575
242 4,595,576
245 4,595,577
338 4,595,578
487 4,595,579
593 4,595,580
625 4,595,581

CLASS 424

3 4,595,582
15 4,595,583
19 4,595,584
47 4,595,585
59 4,595,586
81 4,595,587
89 4,595,588
93 4,595,589
4,595,590
127 4,595,591
195.1 4,595,592
4,595,593

CLASS 425

7 4,595,350
114 4,595,351

CLASS 426

35 4,595,594
438 4,595,595
549 4,595,596
555 4,595,597

CLASS 427

2 4,595,598
5 4,595,599
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53.1 4,595,601
76 4,595,602
82 4,595,603
96 4,595,604
4,595,605
4,595,606
185 4,595,607
237 4,595,608
377 4,595,609

CLASS 428

35 4,595,611
4,595,612
4,595,613
4,595,614
36 4,595,615
68 4,595,616
95 4,595,617
100 4,595,618
114 4,595,619
121 4,595,620
159 4,595,621
173 4,595,622
195 4,595,623
213 4,595,624
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265 4,595,628
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412 4,595,633
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447 4,595,635
489 4,595,636
608 4,595,637
614 4,595,638
690 4,595,639
695 4,595,640

CLASS 429

1 4,595,641
19 4,595,642
27 4,595,643

CLASS 430

57 4,595,644
84 4,595,645
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138 4,595,647
162 4,595,648
296 4,595,649
387 4,595,650
394 4,595,651
559 4,595,652

CLASS 431

254 4,595,352
263 4,595,353
264 4,595,354
265 4,595,355
352 4,595,356

CLASS 432

8 4,595,357
65 4,595,358
205 4,595,359
253 4,595,360

CLASS 433

18 4,595,361
129 4,595,362
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185 4,595,364
216 4,595,365
225 4,595,376

CLASS 434

60 4,595,366
147 4,595,367
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302 4,595,369

CLASS 435

5 4,595,653
7 4,595,654
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41 4,595,657
68 4,595,658
135 4,595,659
172.3 4,595,660

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53 4,595,370
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88 4,595,372
104 4,595,373

CLASS 441

35 4,595,374

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14 4,595,375
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99 4,595,378
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451 4,595,380
463 4,595,381

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82 4,595,382
162 4,595,383

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204 4,595,388

CLASS 493

227 4,595,389

CLASS 501

15 4,595,662
103 4,595,663
124 4,595,664
128 4,595,665

CLASS 502

26 4,595,666
63 4,595,667
66 4,595,668
74 4,595,669
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219 4,595,672
227 4,595,673

CLASS 514

9 4,595,674
10 4,595,675
12 4,595,676
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67 4,595,679
77 4,595,680
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83 4,595,682
221 4,595,684
222 4,595,683
225 4,595,685
236 4,595,686
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337 4,595,689
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461 4,595,693
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616 4,595,700

CLASS 518

701 4,595,701
713 4,595,702
715 4,595,703

CLASS 521

31 4,595,704
51 4,595,705
53 4,595,706
62 4,595,707
63 4,595,708
79 4,595,709
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158 4,595,711
167 4,595,712

CLASS 522

29 4,595,471
99 4,595,472

CLASS 523

105 4,595,713
179 4,595,714
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414 4,595,717
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500 4,595,719

CLASS 524

100 4,595,720
160 4,595,721
398 4,595,723
409 4,595,724

CLASS 525

33 4,595,725
71 4,595,726
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81 4,595,728
147 4,595,729
178 4,595,730
329.1 4,595,731
417 4,595,732
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524 4,595,734

CLASS 526

125 4,595,735
264 4,595,737
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CLASS 528

15 4,595,739
30 4,595,740
53 4,595,741
64 4,595,742
73 4,595,743
83 4,595,744
125 4,595,745
312 4,595,746
319 4,595,747
388 4,595,748
483 4,595,749

CLASS 544

90 4,595,750
105 4,595,751
258 4,595,752

CLASS 546

18 4,595,754
21 4,595,753
94 4,595,755
99 4,595,756
197 4,595,757
212 4,595,758
234 4,595,759
256 4,595,760
263 4,595,761
288 4,595,762
290 4,595,763

CLASS 548

201 4,595,764
491 4,595,765
4,595,766

CLASS 549

60 4,595,767
307 4,595,768
470 4,595,769
541 4,595,770

CLASS 556

77 4,595,771
4,595,772
110 4,595,773
118 4,595,774
409 4,595,775
436 4,595,776
478 4,595,777

CLASS 558

414 4,595,540

CLASS 560

208 4,595,778

CLASS 564

2 4,595,779
79 4,595,780
102 4,595,781
106 4,595,782

CLASS 568

9 4,595,783
387 4,595,784
698 4,595,785
835 4,595,786

CLASS 585

516 4,595,787
621 4,595,788

CLASS 604

9 4,595,390
308 4,595,391
385 A 4,595,392

CLASS 623

22 4,595,393

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D2—	380	284,229		491	284,245		353	284,261	D13—	9	284,278		59	284,293	D26—	48	284,309
	405	284,230			284,246		357	284,262		37	284,277		63	284,294		65	284,310
	422	284,231		522	284,247		382	284,263	D14—	1	284,279		101	284,295		67	284,311
		284,232		601	284,248			284,264		2	284,280		109	284,296			284,312
	442	284,233	D7—	5	284,249			284,265		30	284,281		195	284,297		94	284,313
D3—	12	284,234		39	284,250			284,266		60	284,282		222	284,298		139	284,314
	74	284,235		43	284,251		385	284,267		68	284,283	D22—	25	284,299	D28—	34	284,315
D4—	104	284,236		53	284,252		402	284,268		114	284,284	D23—	4	284,300		44	284,316
	122	284,237		76	284,253	D9—	349	284,269		115	284,285		17	284,301		49	284,317
D6—	379	284,238			284,254		454	284,270	D15—	127	284,286		25	284,302		93	284,318
	380	284,239		77	284,255	D10—	4	284,271	D16—	8	284,287		65	284,303	D32—	21	284,319
	381	284,240		334	284,256		106	284,272	D18—	7	284,288		155	284,304	D34—	1	284,320
	421	284,241		338	284,258	D11—	133	284,273		22	284,289		163	284,305	D99—	28	284,321
	430	284,242		355	284,257	D12—	94	284,274	D19—	36	284,290	D24—	25	284,306			284,323
	432	284,243	D8—	303	284,259		142	284,275	D20—	27	284,291	D25—	17	284,307		34	284,322

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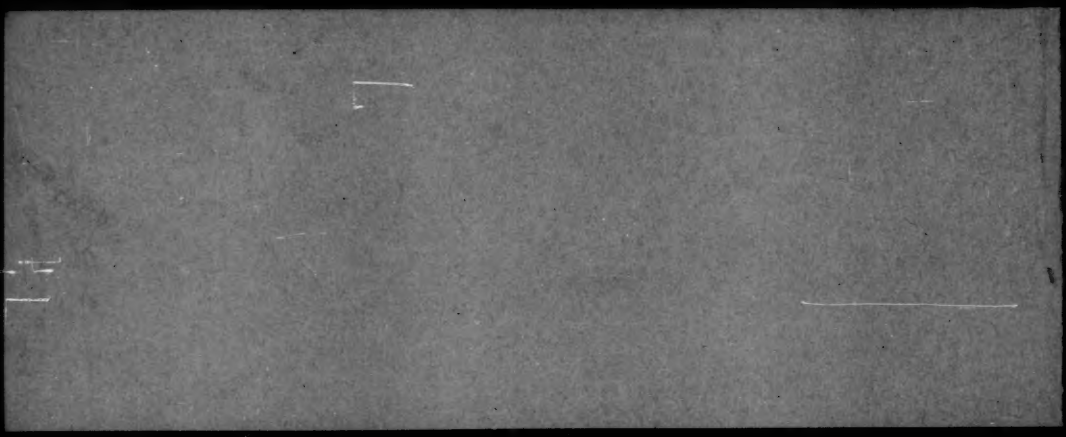

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